

Company: Noble Energy Inc.

Well: Hurley H26-724

Field: Wattenberg

County: Weld State: Colorado

UltraSonic Summary Print

County:	Weld
Field:	Wattenberg
Location:	SENE Sec. 26, T3N, R65W
Well:	Hurley H26-724
Company:	Noble Energy Inc.
Location:	
SENE Sec. 26, T3N, R65W	Elev.: K.B. 4883.00 ft
SHL: 2233' FNL & 997' FEL	G.L. 4853.00 ft
Lat/Long: 40.1974 / -104.62476	D.F. 4883.00 ft
Permanent Datum:	Ground Level
Log Measured From:	Kelly Bushing
Drilling Measured From:	Kelly Bushing
API Serial No.	Section: 26
05-123-46769	Township: 3N
	Range: 65W

Logging Date	06-Sep-2018
Run Number	1
Depth Driller	16182.00 ft
Schlumberger Depth	16182.00 ft
Bottom Log Interval	6680.00 ft
Top Log Interval	100.00 ft
Casing Fluid Type	Brine
Salinity	
Density	8.4 lbm/gal
Fluid Level	0.00 ft
BIT/CASING/TUBING STRING	
Bit Size	8.50 in
From	1954.00 ft
To	16182.00 ft
Casing/Tubing Size	5.5 in
Weight	20 lbm/ft
Grade	P110
From	0.00 ft
To	16165.30 ft
Max Recorded Temperatures	211 degF
Logger on Bottom	06-Sep-2018 09:33:00
Unit Number	9108
Recorded By	Ali AlRamadhan
Witnessed By	Bill Mansfield

Disclaimer

THE USE OF AND RELIANCE UPON THIS RECORDED-DATA BY THE HEREIN NAMED COMPANY (AND ANY OF ITS AFFILIATES, PARTNERS, REPRESENTATIVES, AGENTS, CONSULTANTS AND EMPLOYEES) IS SUBJECT TO THE TERMS AND CONDITIONS AGREED UPON BETWEEN SCHLUMBERGER AND THE COMPANY, INCLUDING: (a) RESTRICTIONS ON USE OF THE RECORDED-DATA; (b) DISCLAIMERS AND WAIVERS OF WARRANTIES AND REPRESENTATIONS REGARDING COMPANY'S USE AND RELIANCE UPON THE RECORDED-DATA; AND (c) CUSTOMER'S FULL AND SOLE RESPONSIBILITY FOR ANY INFERENCE DRAWN OR DECISION MADE IN CONNECTION WITH THE USE OF THIS RECORDED-DATA.

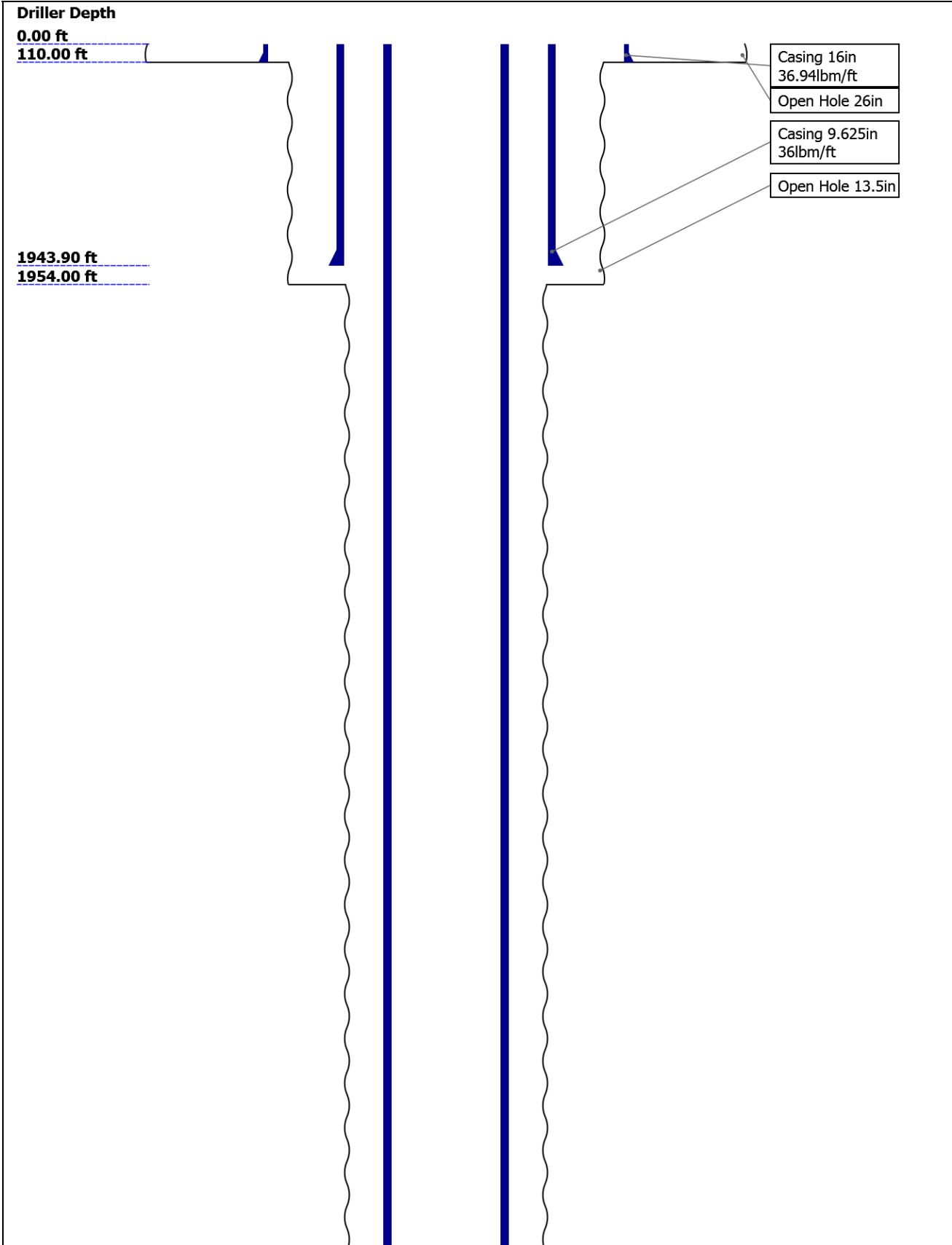
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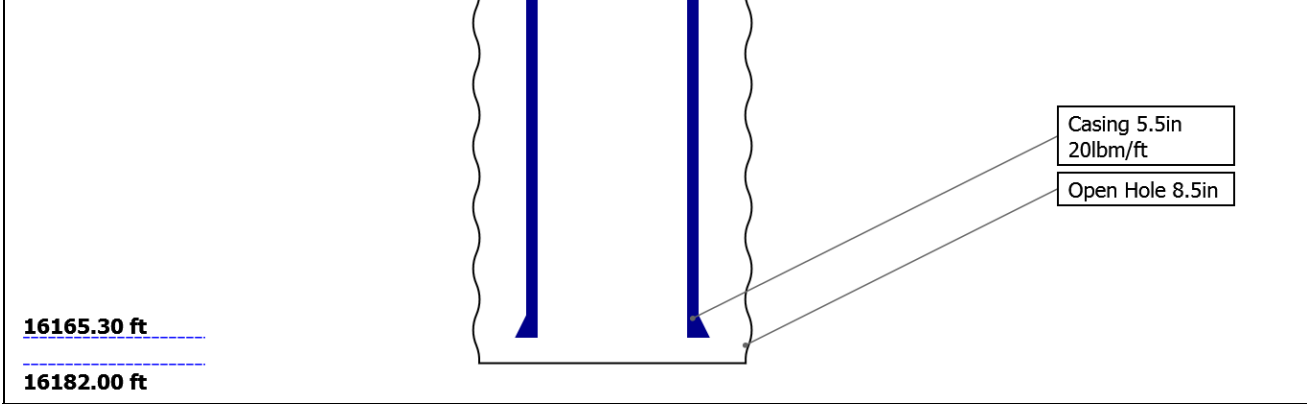
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Well Sketch






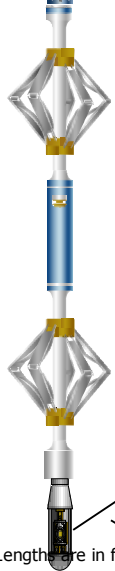
Borehole Size/Casing/Tubing Record

Bit						
Bit Size (in)	26	13.5	8.5			
Top Driller (ft)	0	110	1954			
Top Logger (ft)	0	110	1954			
Bottom Driller (ft)	110	1954	16182			
Bottom Logger (ft)	110	1954	16182			
Casing						
Size (in)	16	9.625	5.5			
Weight (lbm/ft)	36.94	36	20			
Inner Diameter (in)	15.572	8.921	4.778			
Grade	N/A	J55	P110			
Top Driller (ft)	0	0	0			
Top Logger (ft)	0	0	0			
Bottom Driller (ft)	110	1943.9	16165.3			
Bottom Logger (ft)	110	1943.9	16165.3			

Remarks and Equipment Summary

1: Toolstring				1: Remarks	
<div><div><div>Equip nameLength</div><div>LEH-QT29.54</div><div>LEH-QT</div></div><div><div>EDTC-B:826.06</div><div>473M</div><div>EDTH-B:8624</div><div>EDTG-B:77434</div><div>EDTC-B:8473M</div></div><div><div>AH-184[2]:5941</div><div>AH-184[1]:5965</div><div>USIT-E:9015.56</div><div>0</div><div>ECH-MFA:1818</div><div>USAC-A:900</div><div>USAC-A:10</div></div></div> <div></div> <div><div>MP nameOffset</div><div>CTEM22.56</div><div>ACCZ0.00</div><div>HV0.00</div><div>Gamma20.69</div><div>Ray</div><div>TelStatu19.56</div><div>s</div></div>	Thank you for choosing Schlumberger!				
	Toolstring run as per tool sketch and client logging program.				
	5" gemcos run on EDTC and USAC for centralization.				
	This is the first log in well.				
	Main pass logged at 2500 PSI. Repeat pass logged at 0 PSI.				
	BHT: 211 degF				

USIS-A:19
94
USSC-B:92
5
USRS-AB:
857
USI-SENS
OR:888
USI-TX



USI Sen 0.37
sor
TOOL_ZERO
Head Te
nsion
Length in ft
Maximum Outer Diameter = 3.625 in
Line: Sensor Location, Value: Gating Offset
All measurements are relative to TOOL_ZERO

Depth Summary

1			
Depth Measuring Device			
Type	IDW-B		
Serial Number			
Calibration Date			
Calibrator Serial Number			
Calibration Cable Type			
Wheel Correction 1	0		
Wheel Correction 2	0		
Tension Device			
Type	CMTD-B/A		
Serial Number			
Calibration Date			
Calibrator Serial Number			
Number of Calibration Points	0		
Logging Cable			
Type	7-46NT-XS		
Serial Number			
Length	24000.00 ft		
Conveyance Type	Wireline		
Rig Type	Land		
1:Depth Control Parameters		Depth Control Remarks	
Log Sequence	First Log In the Well	All Schlumberger depth control policies followed. IDW used as primary depth reference. Z-Chart used as secondary depth reference. Log depth shifted to marker joint at 6325.8 ft.	
Rig Up Length At Surface			
Rig Up Length At Bottom			
Rig Up Length Correction			
Stretch Correction			
Tool Zero Check At Surface			

USIT - Fluid Properties Measurement

Run Name	Pass Name	Start Depth(ft)	Stop Depth(ft)
Run 1	Log[4]:Up	6771.79	79.40

Fluid Velocity = "Automatic".
CFVL equals DFSL channel

Start Depth(ft)	Stop Depth(ft)	Start Value(us/ft)	End Value(us/ft)
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Mud Impedance = "FreePipe Norm."
Free Pipe normalization zone is : 25.42m(83.38ft) to 30.18m(99.01ft)
MUD_N_FRP = 1.10
DFD = 1.01g/cm3(8.40lbm/gal)
CZMD median computed in free pipe normalization interval = 1.63 MRayl

Start Depth(ft)	Stop Depth(ft)	Start Value(Mrayl)	End Value(Mrayl)
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1

2500 PSI Main Pass

Software Version

Acquisition System	Version
Maxwell 2018 SP2	8.2.104493.3100

Pass Summary

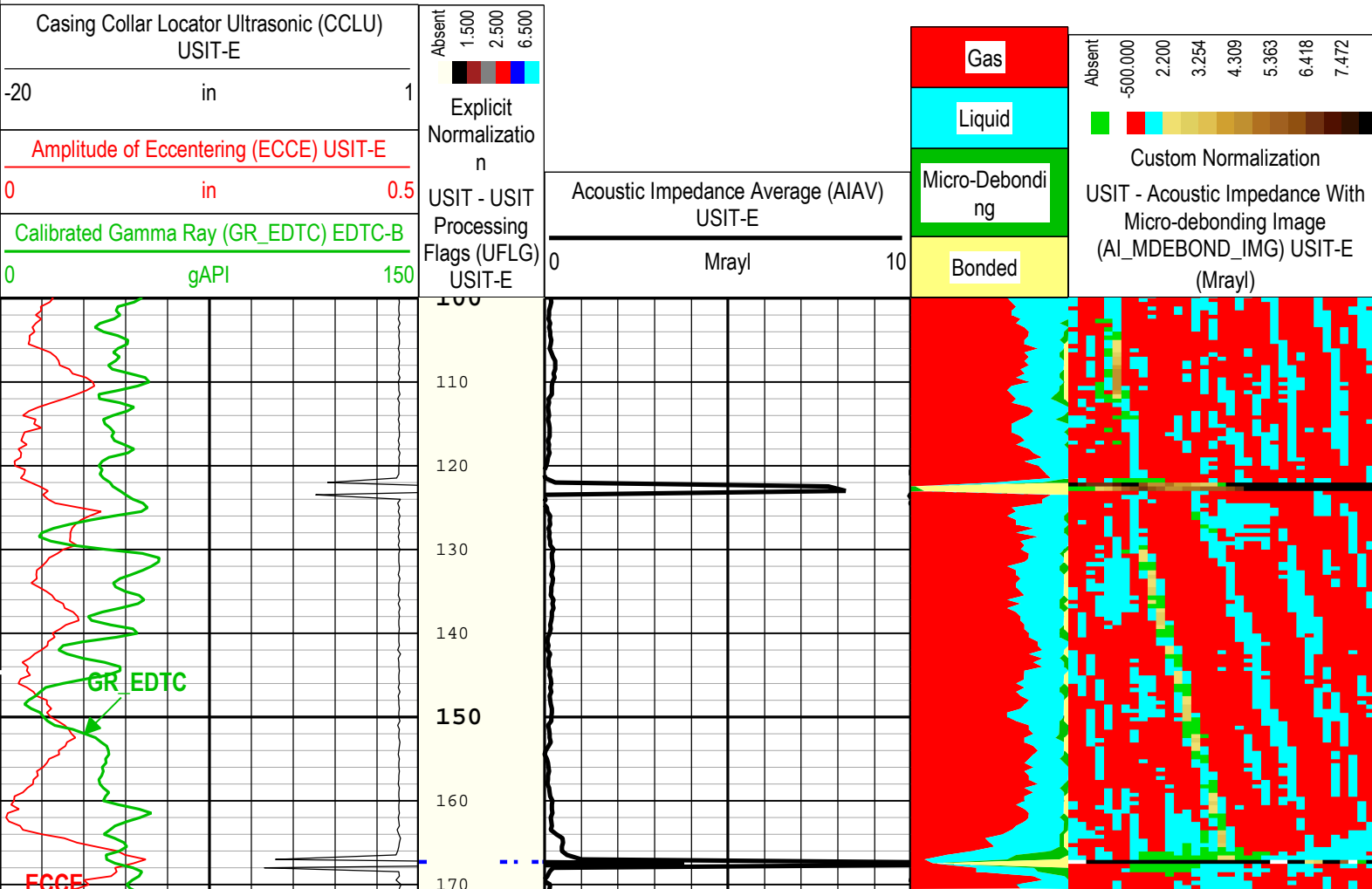
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
1	Log[4]:Up	Up	79.40 ft	6771.79 ft	06-Sep-2018 9:33:40 AM	06-Sep-2018 10:20:10 AM	ON	0.27 ft	No

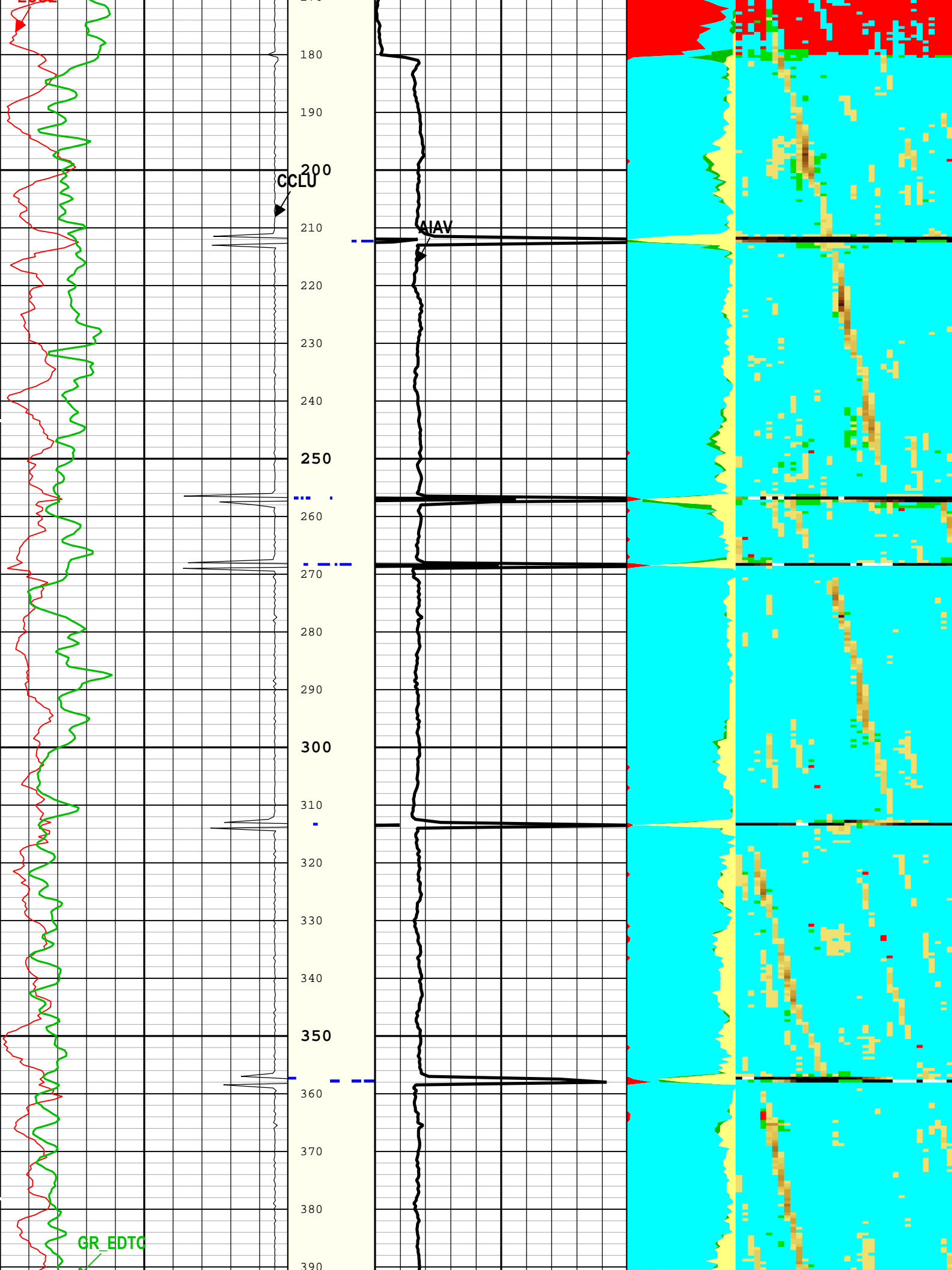
All depths are referenced to toolstring zero

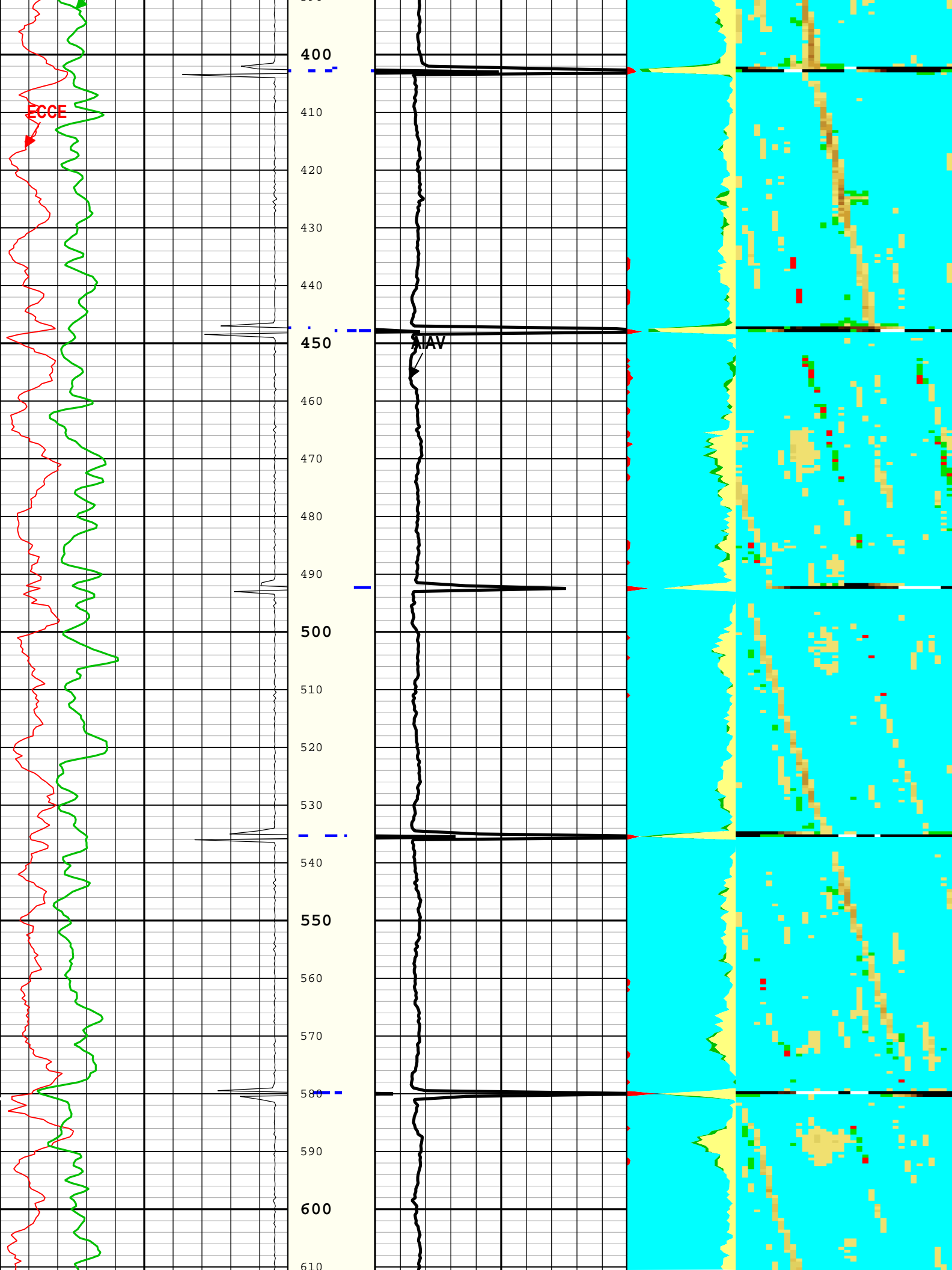
Log	Company:Noble Energy Inc.	Well:Hurley H26-724
		1: Log[4]:Up:S003

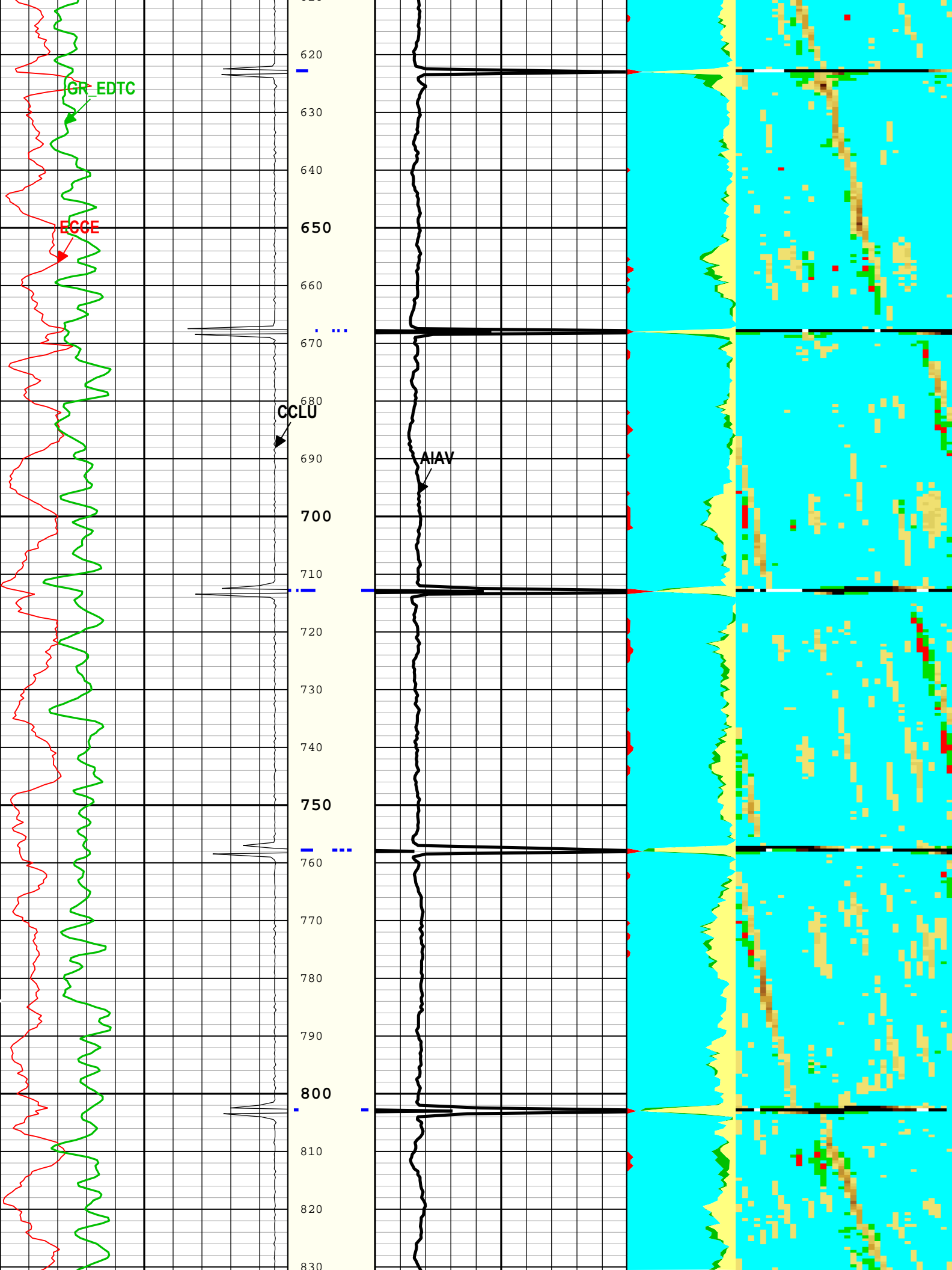
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Creation Date: 06-Sep-2018 15:41:19

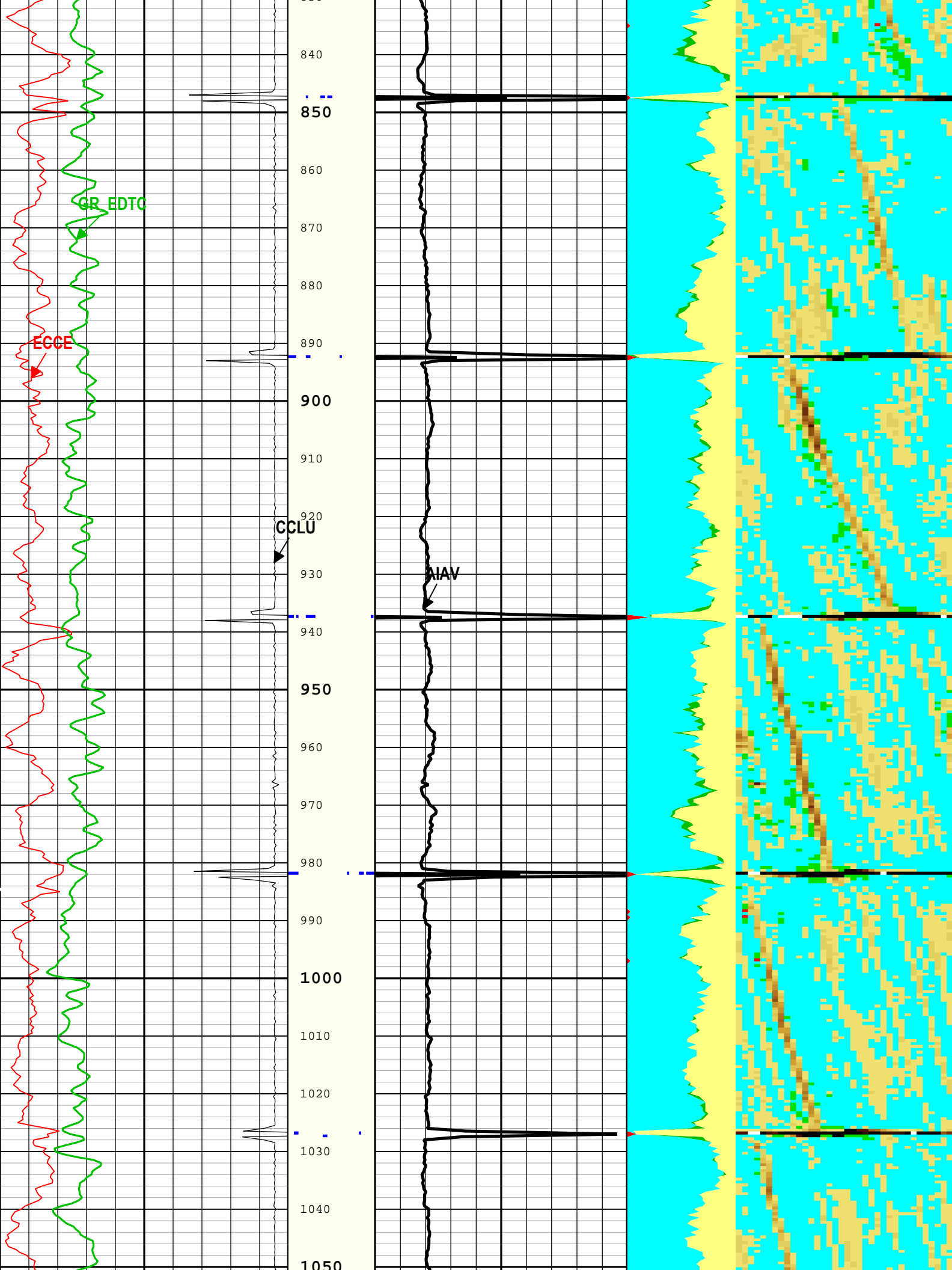
TIME_1900 - Time Marked every 60.00 (s)

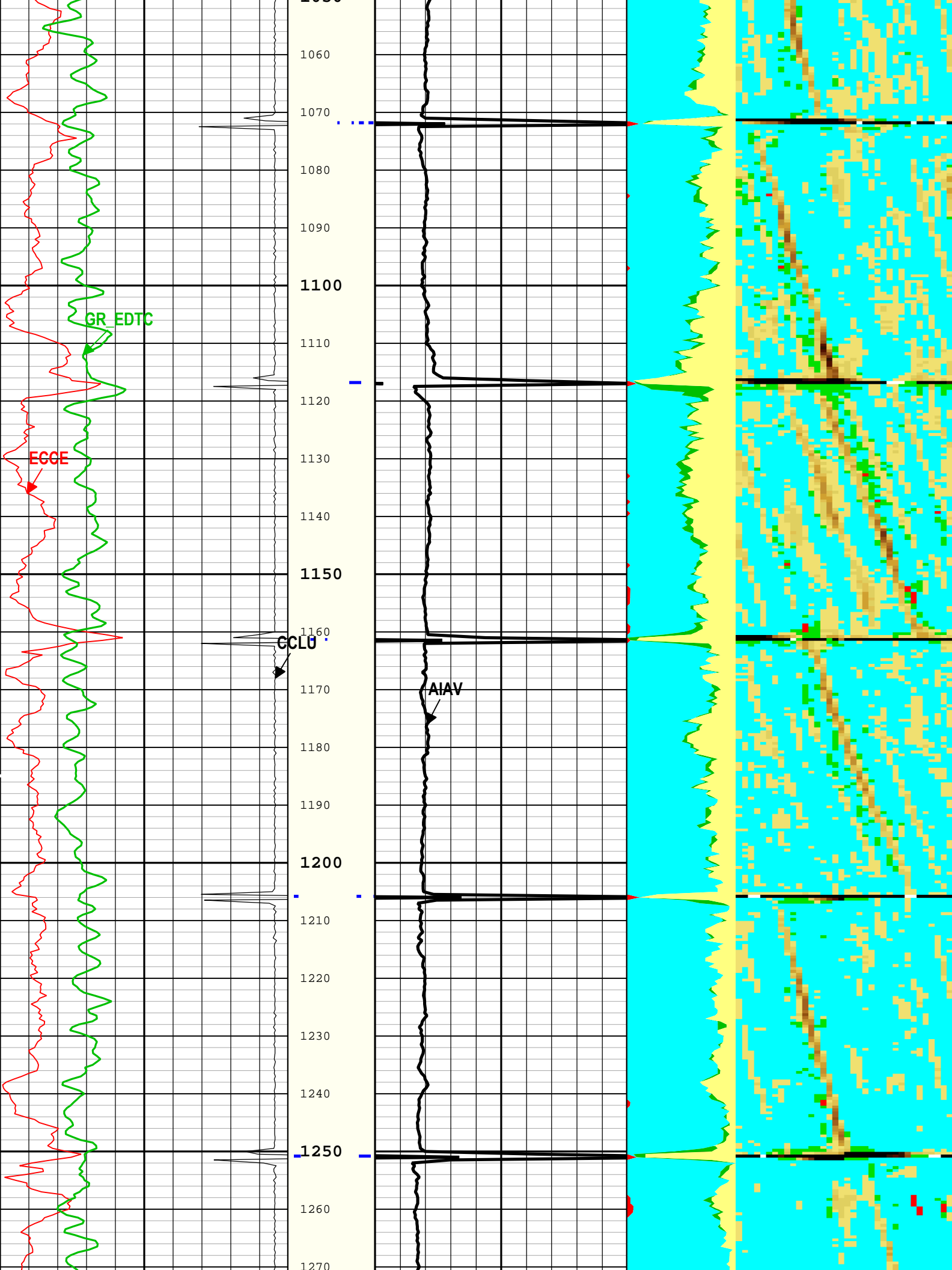


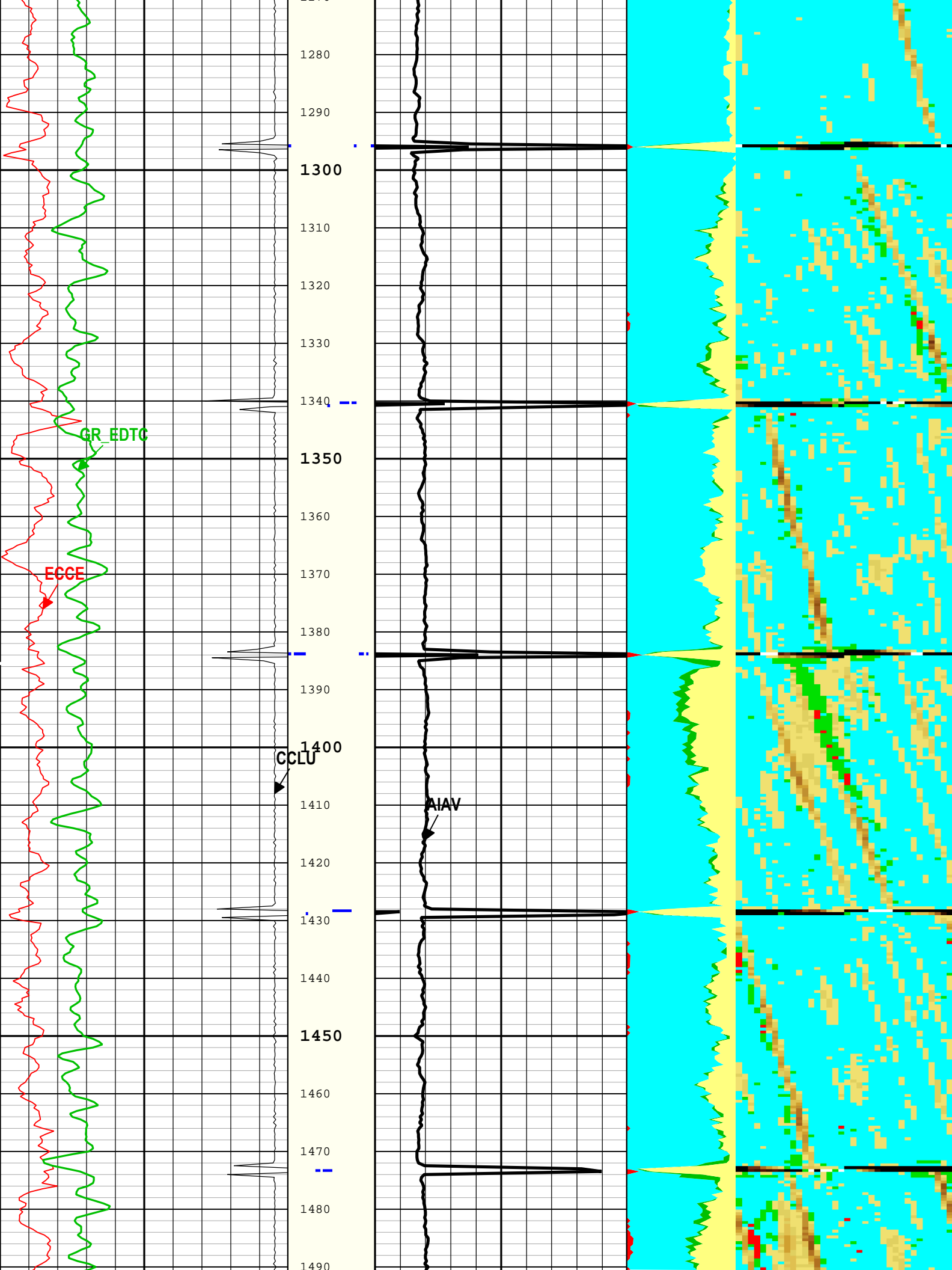


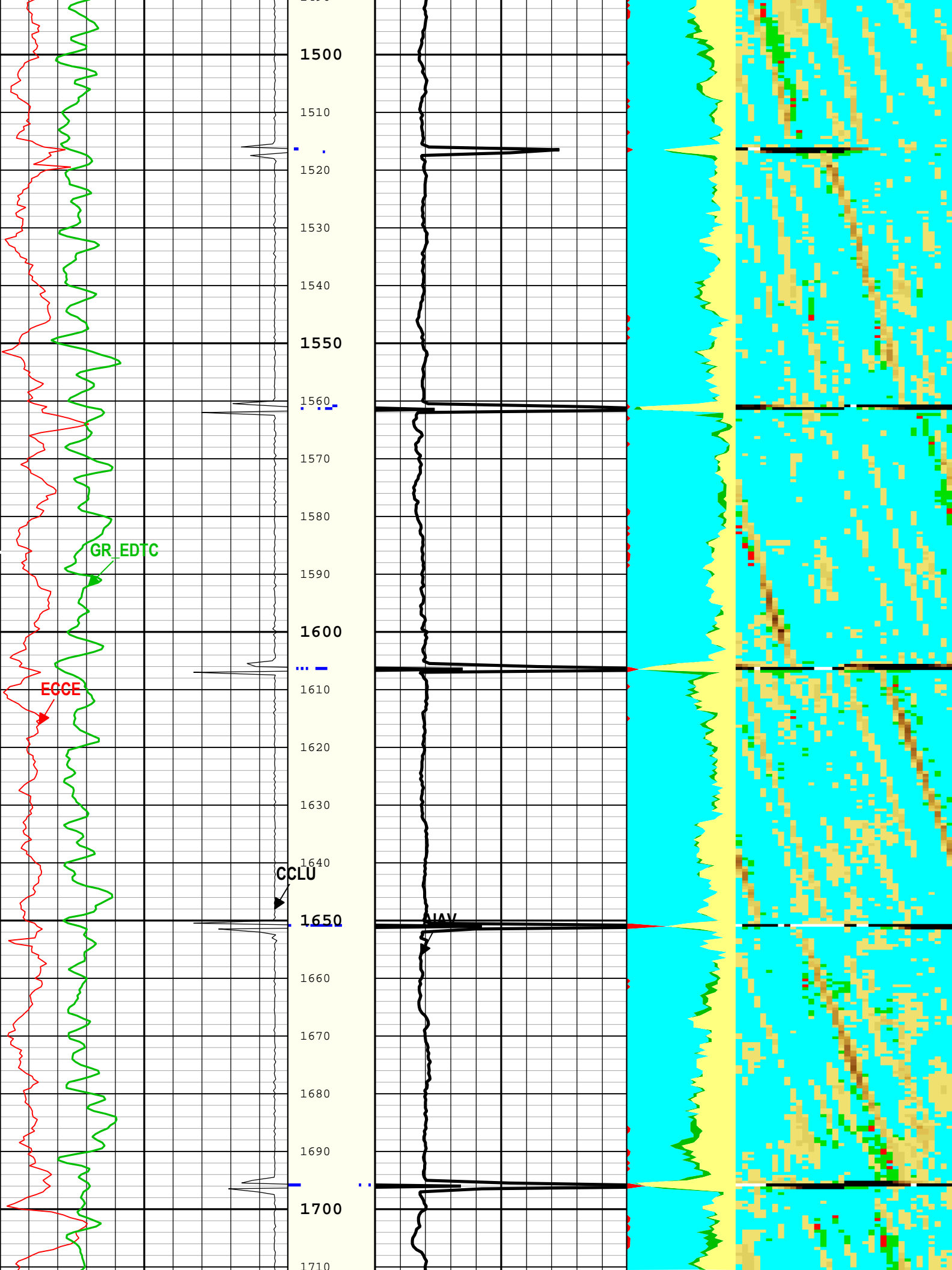


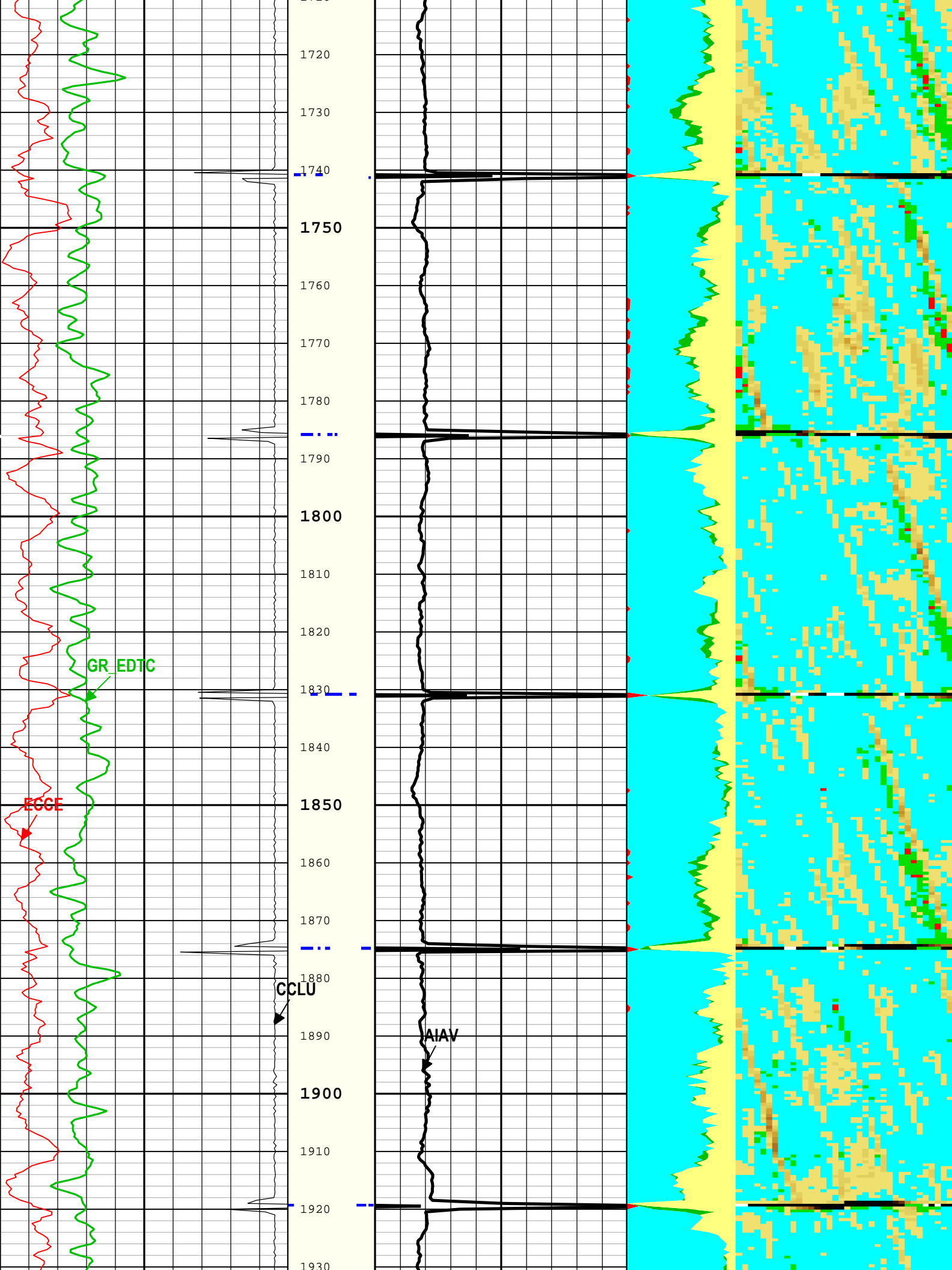


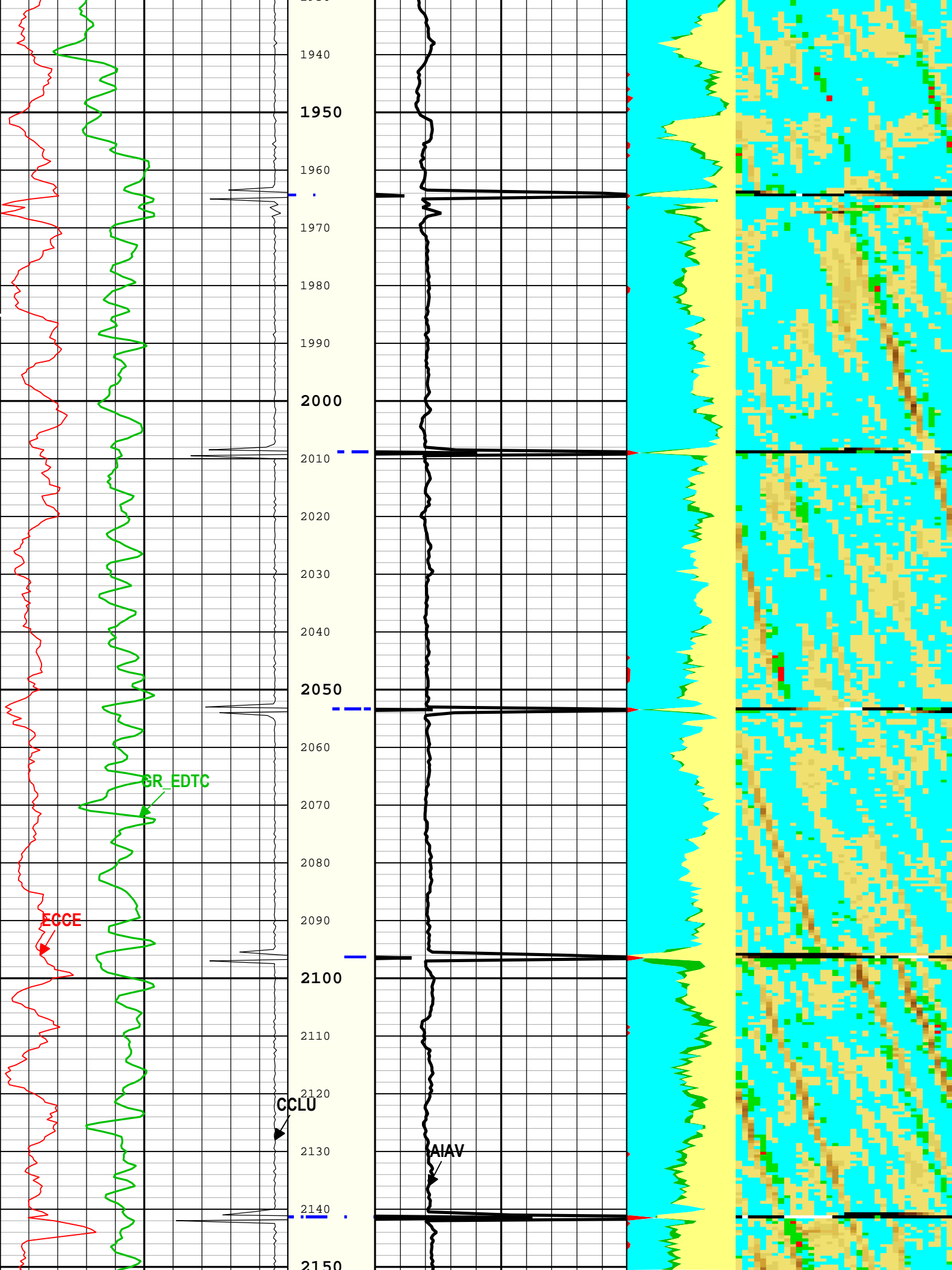


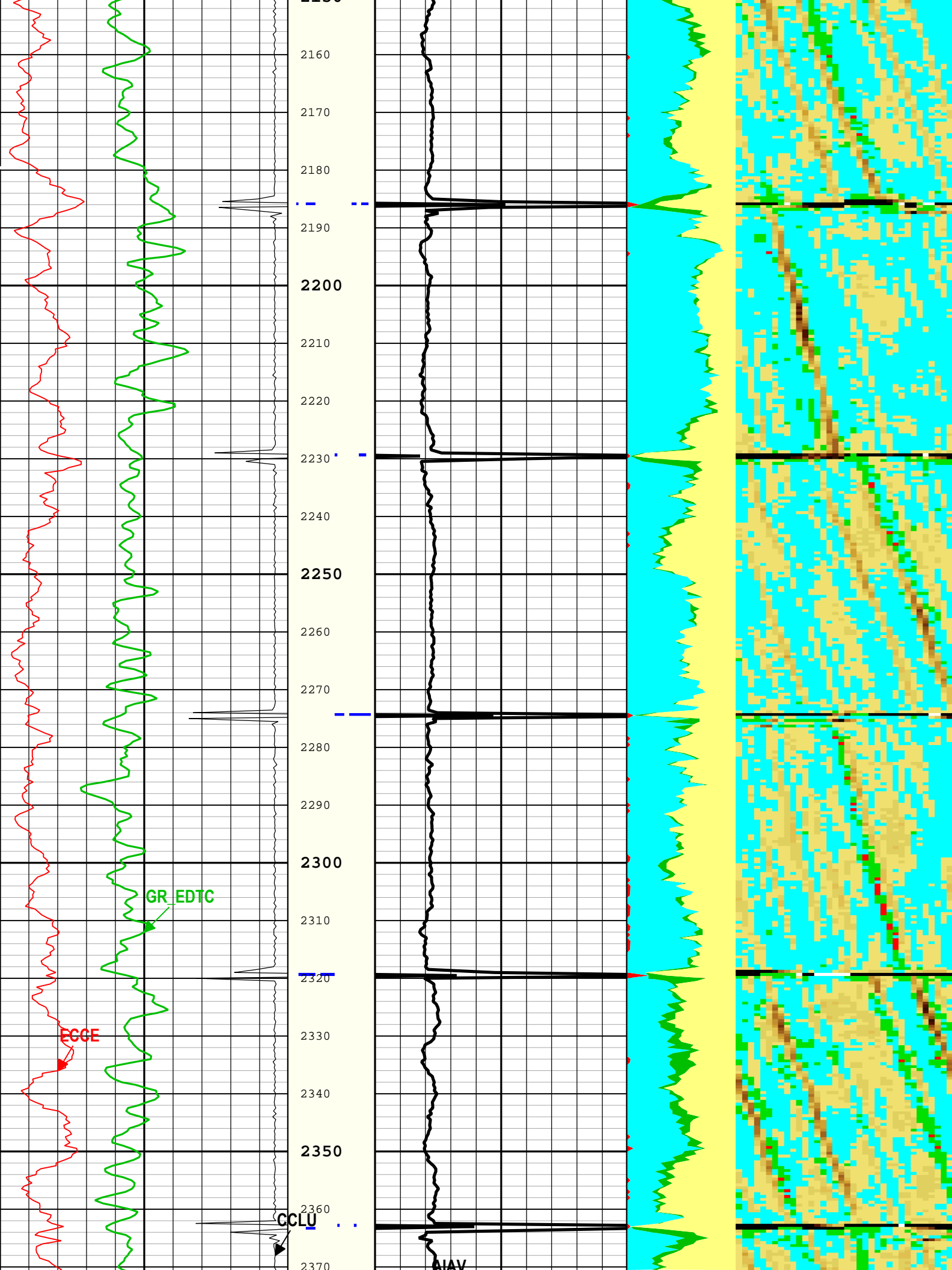


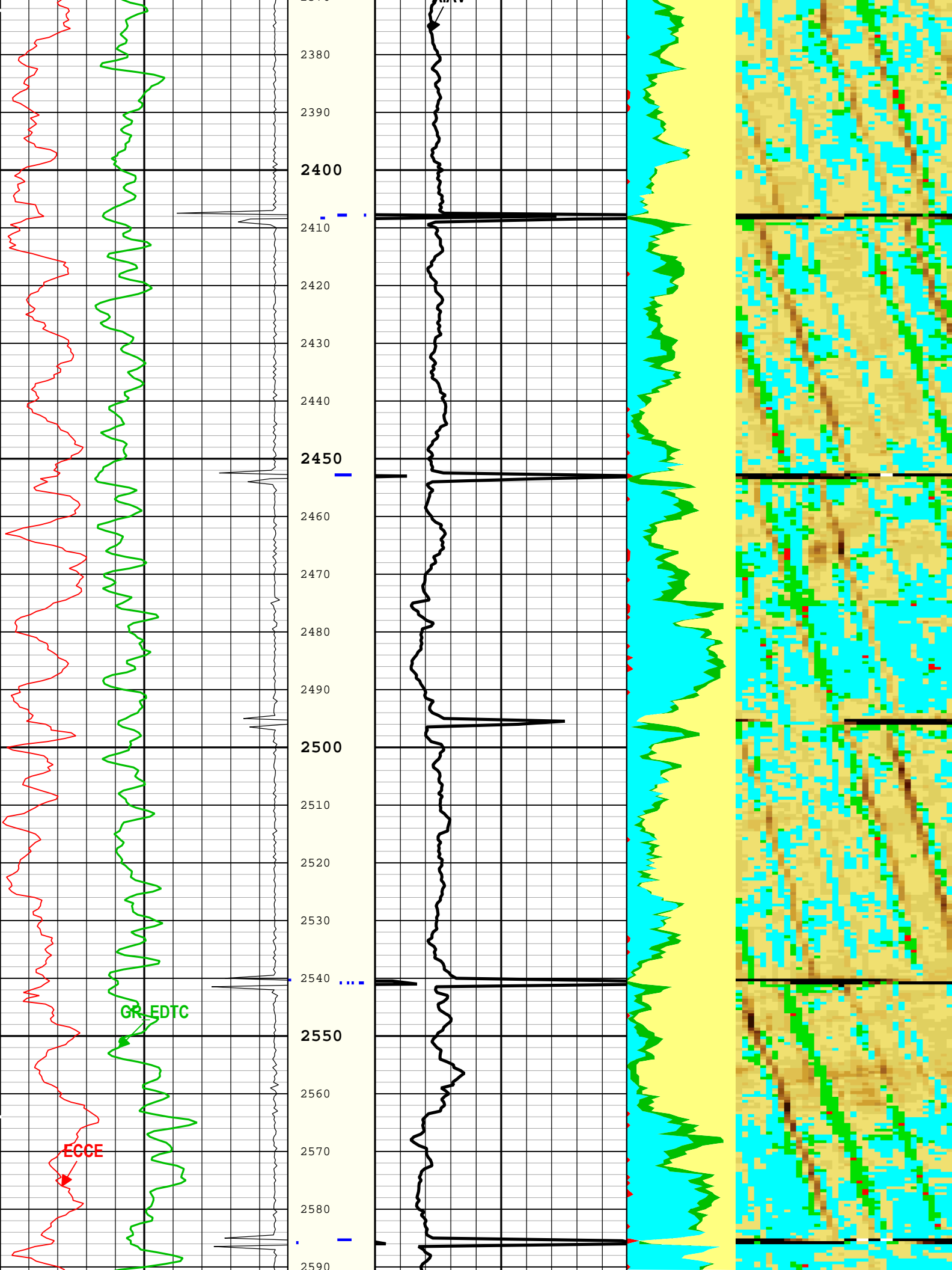


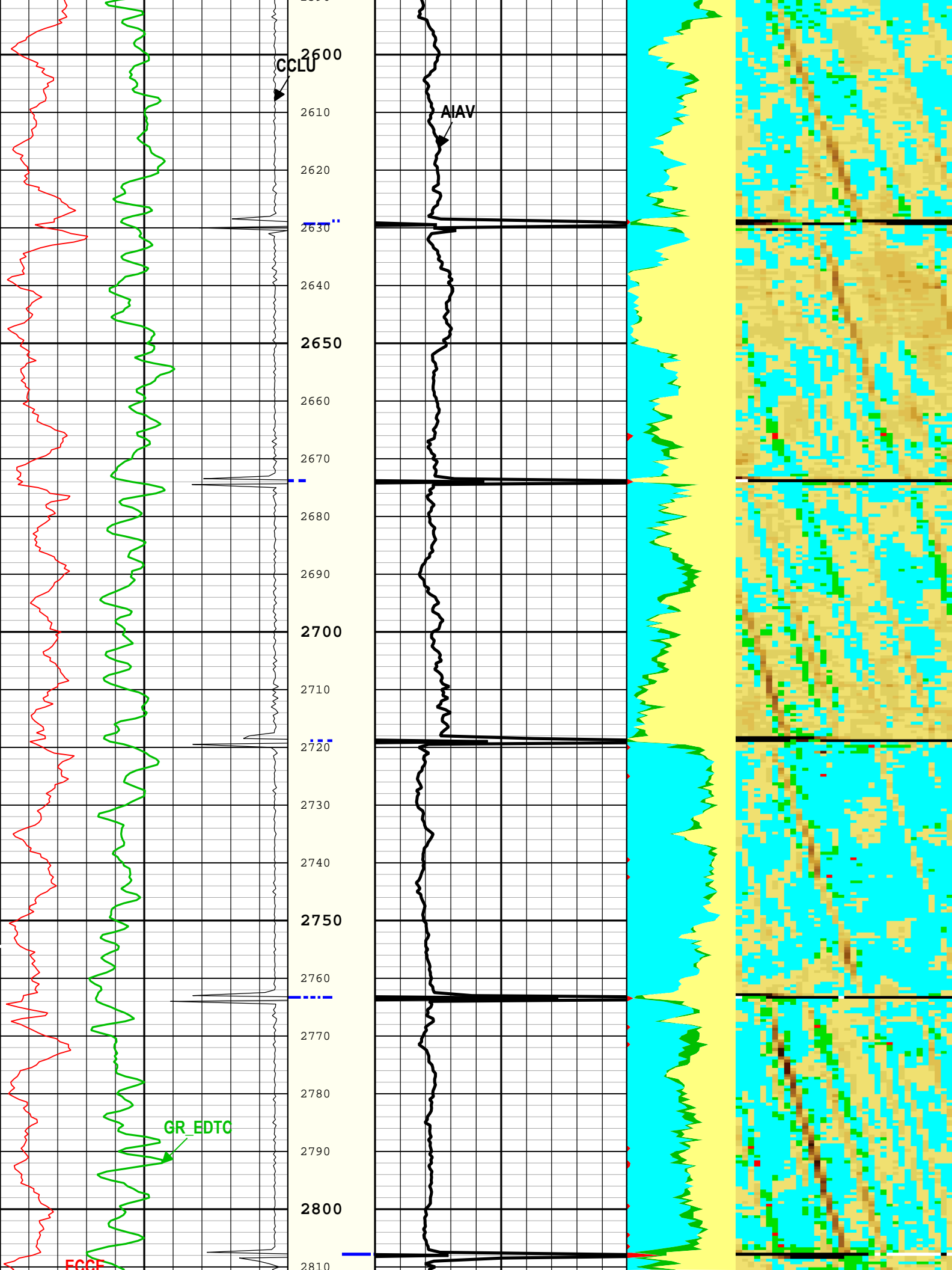


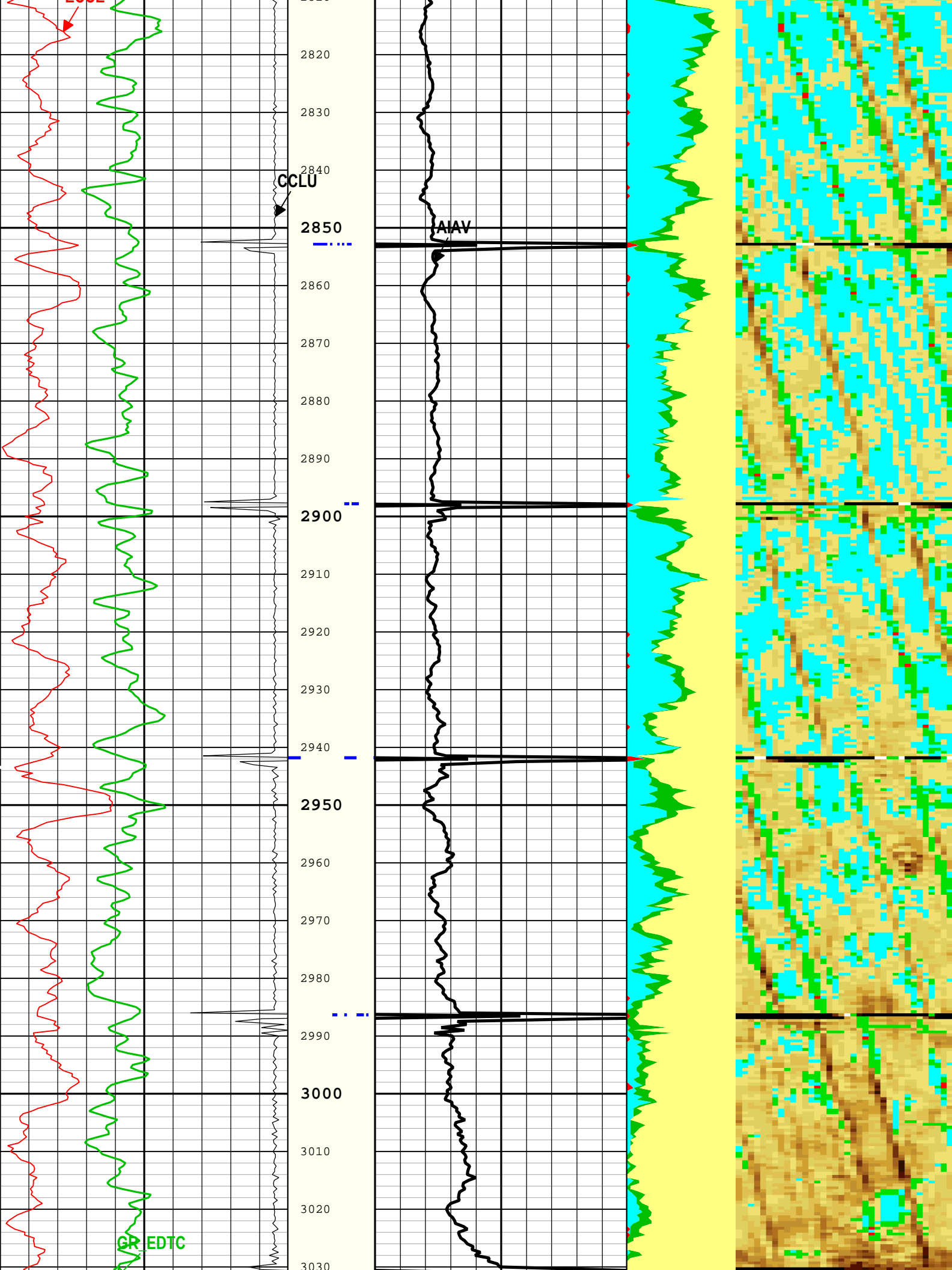


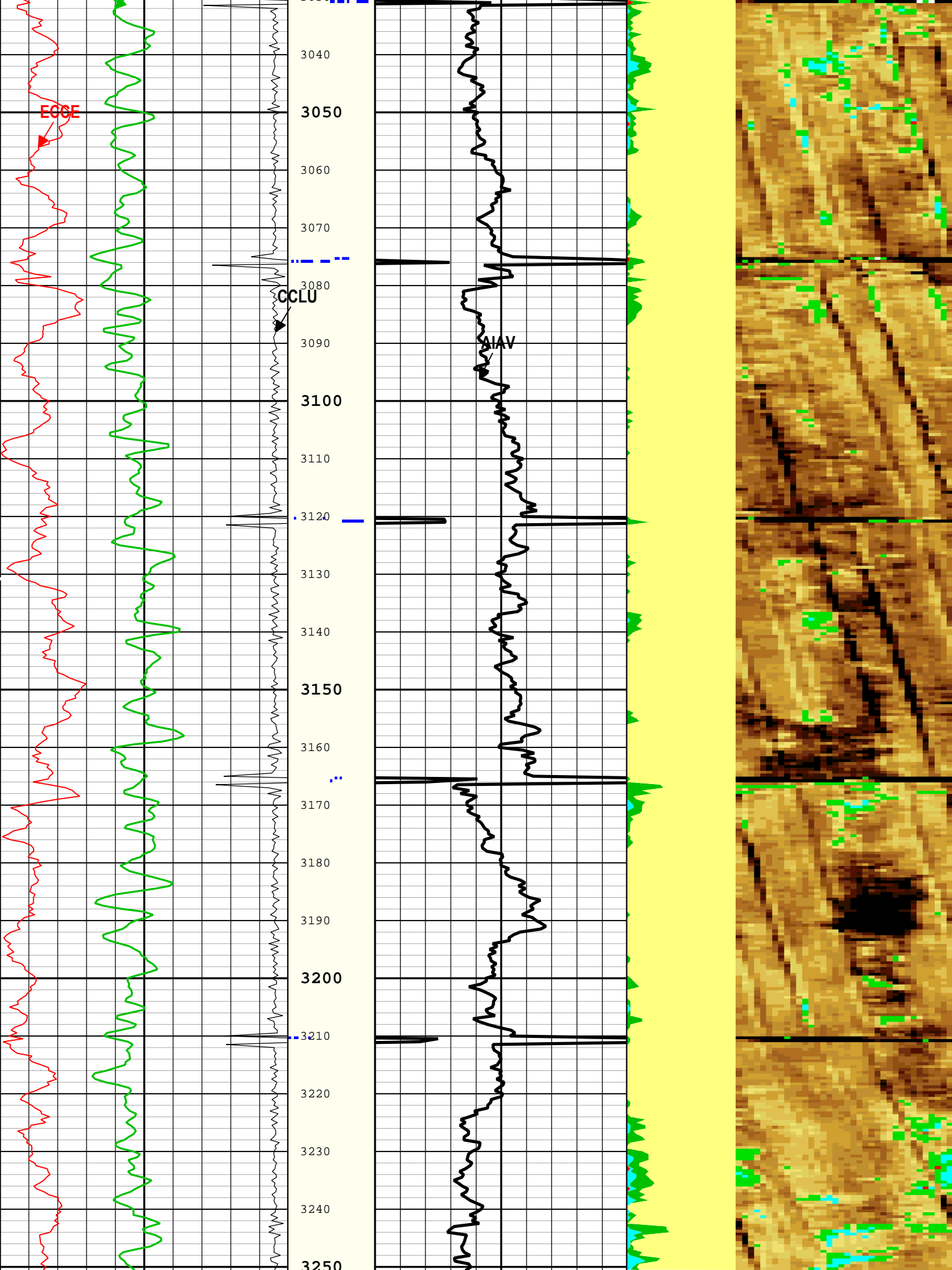


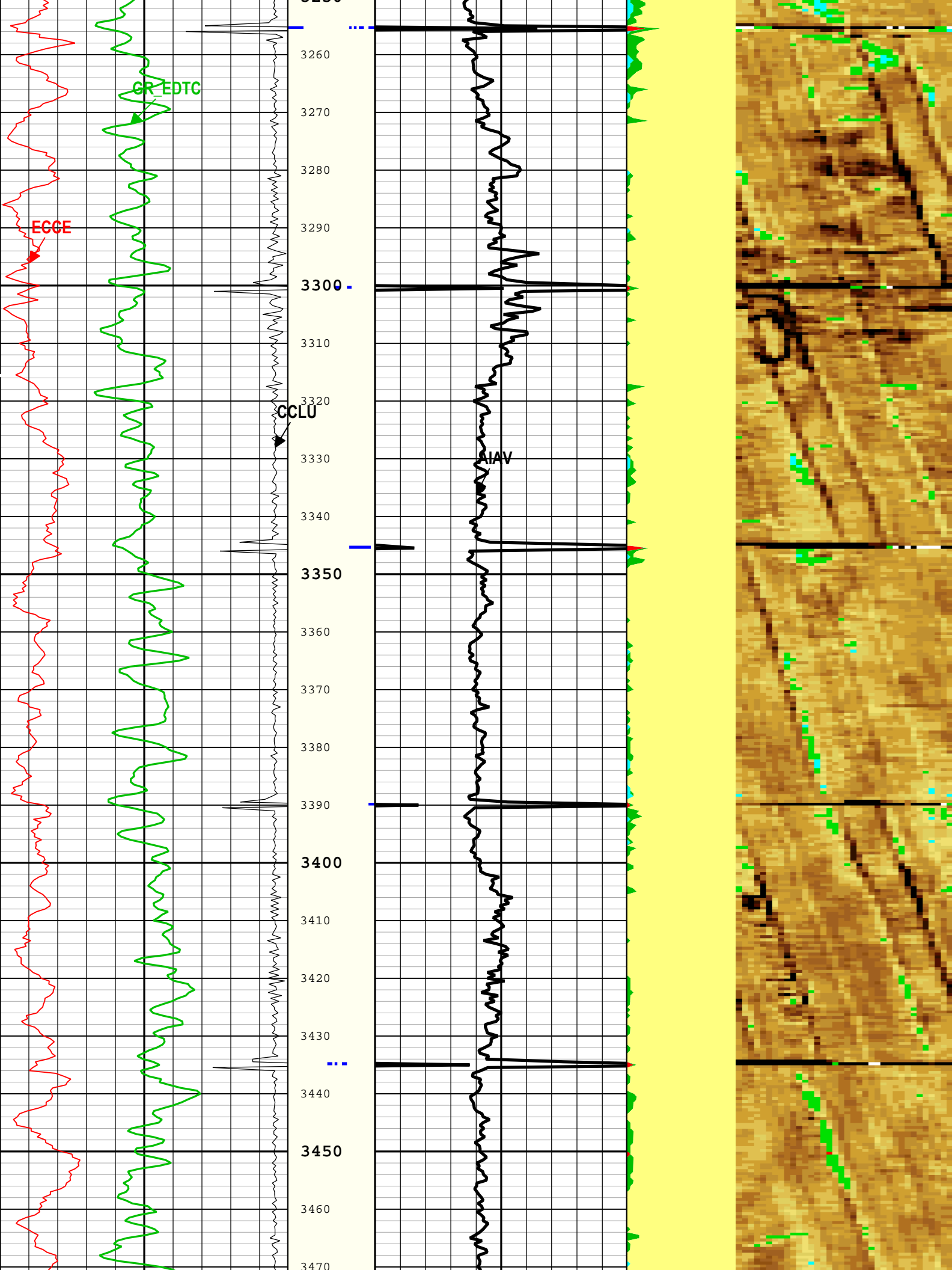


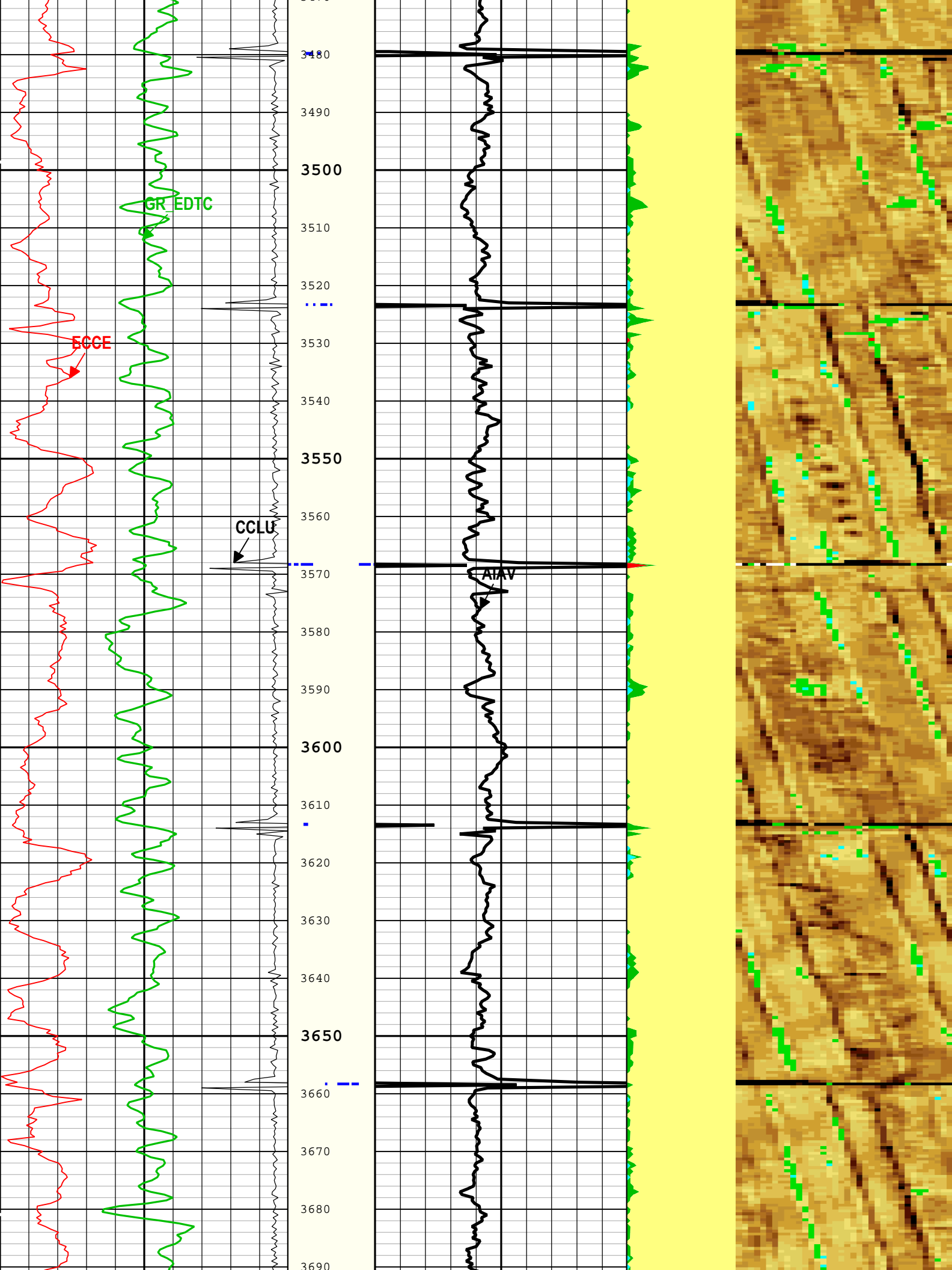


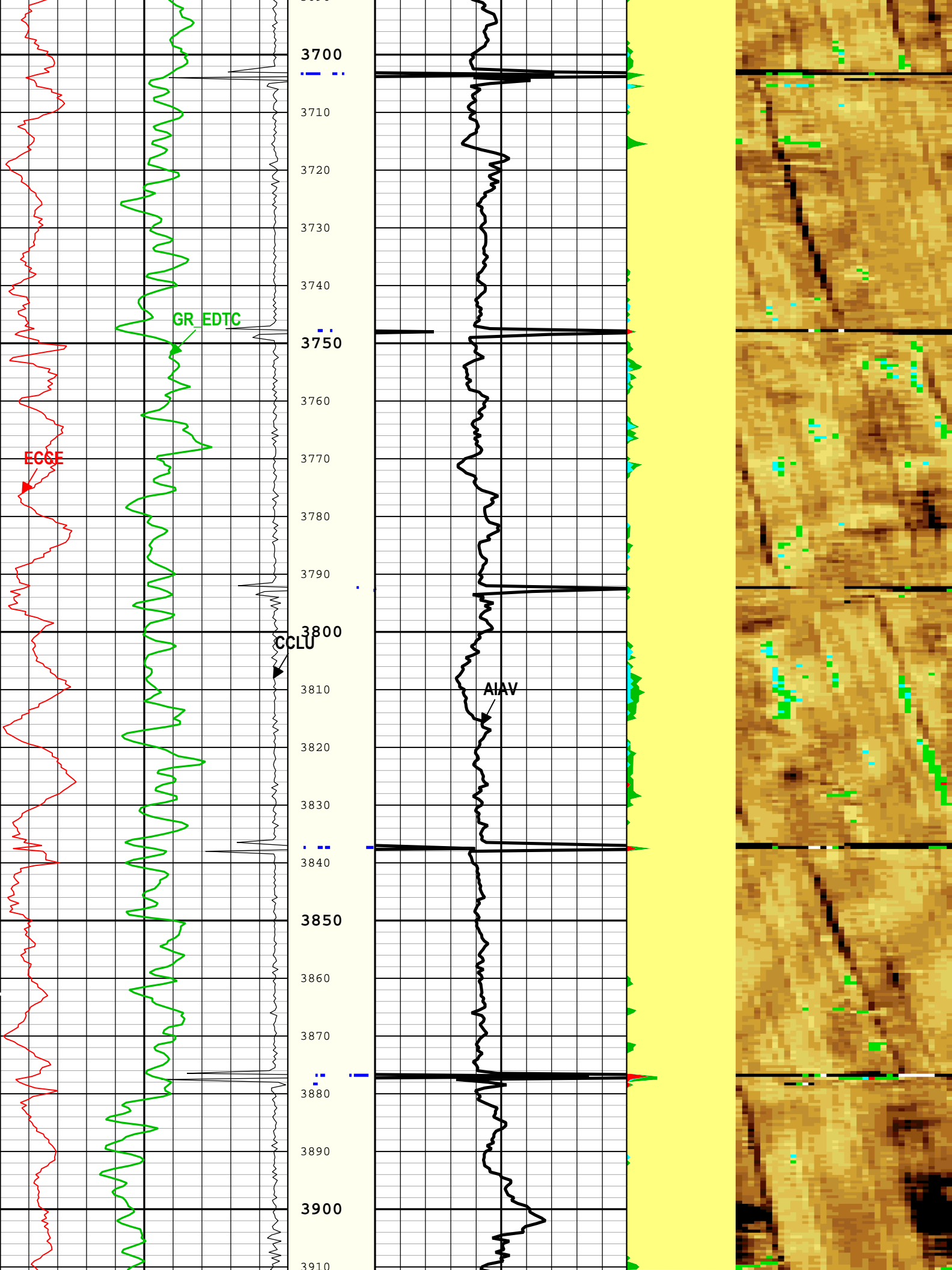


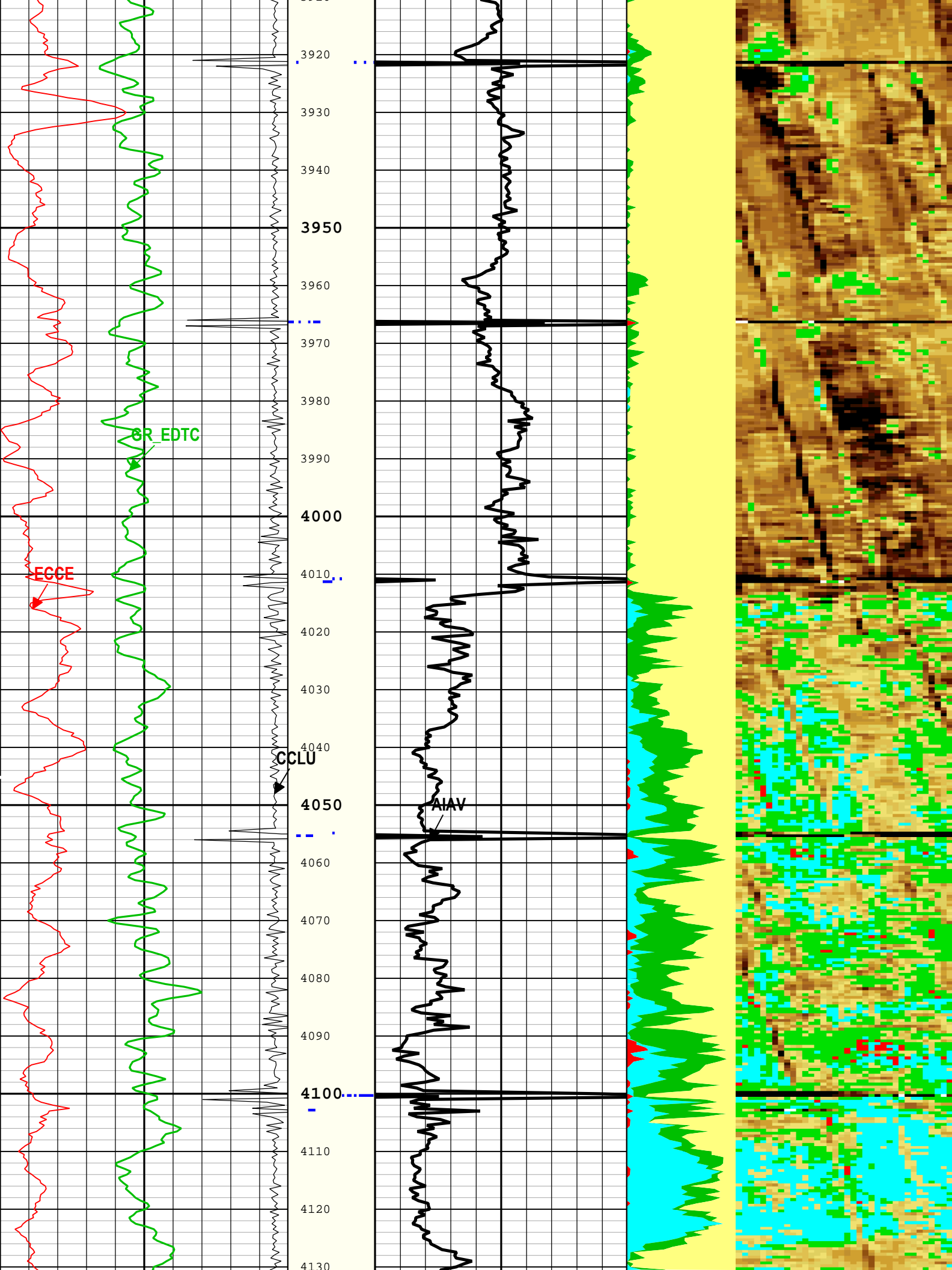


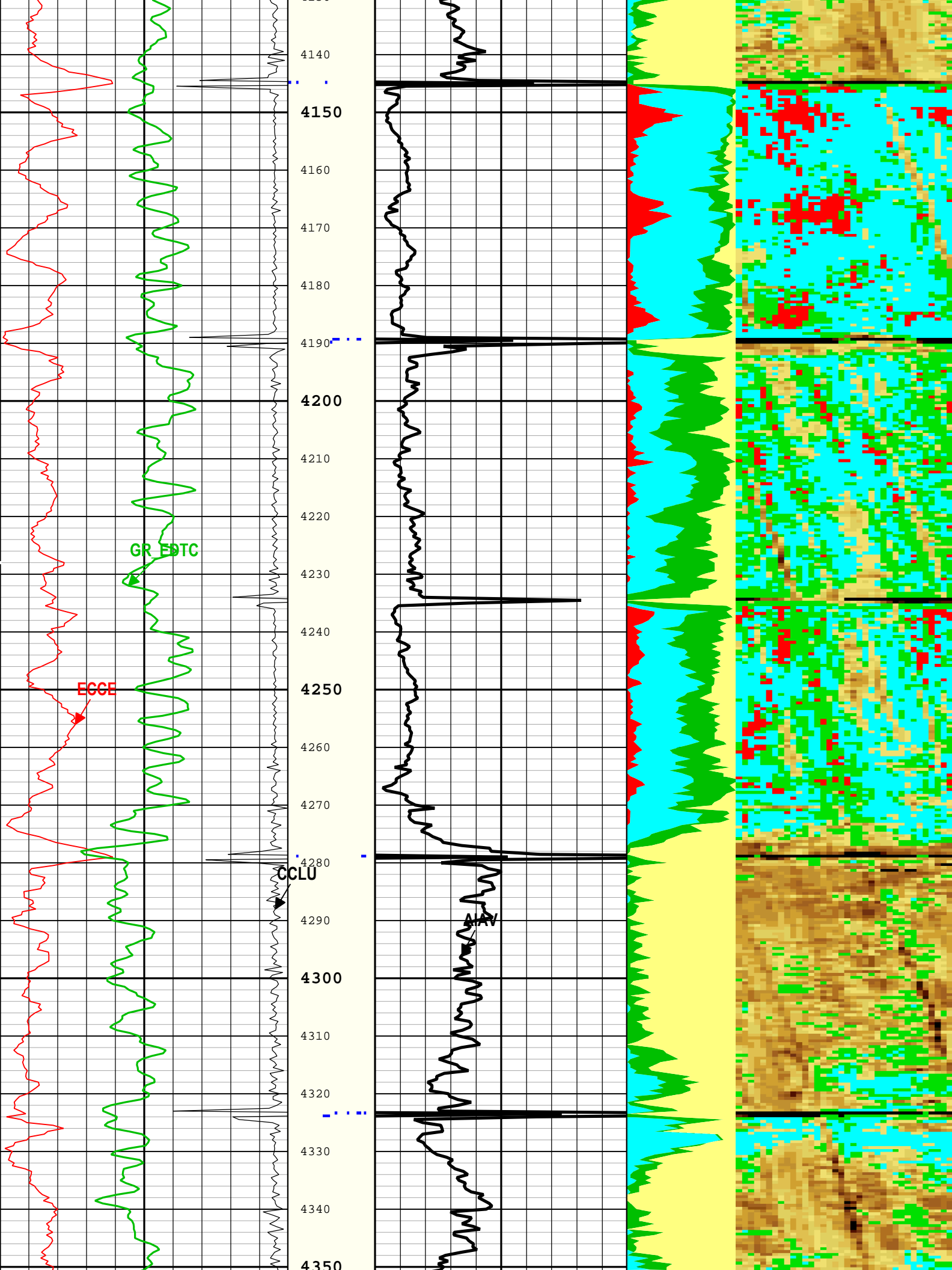


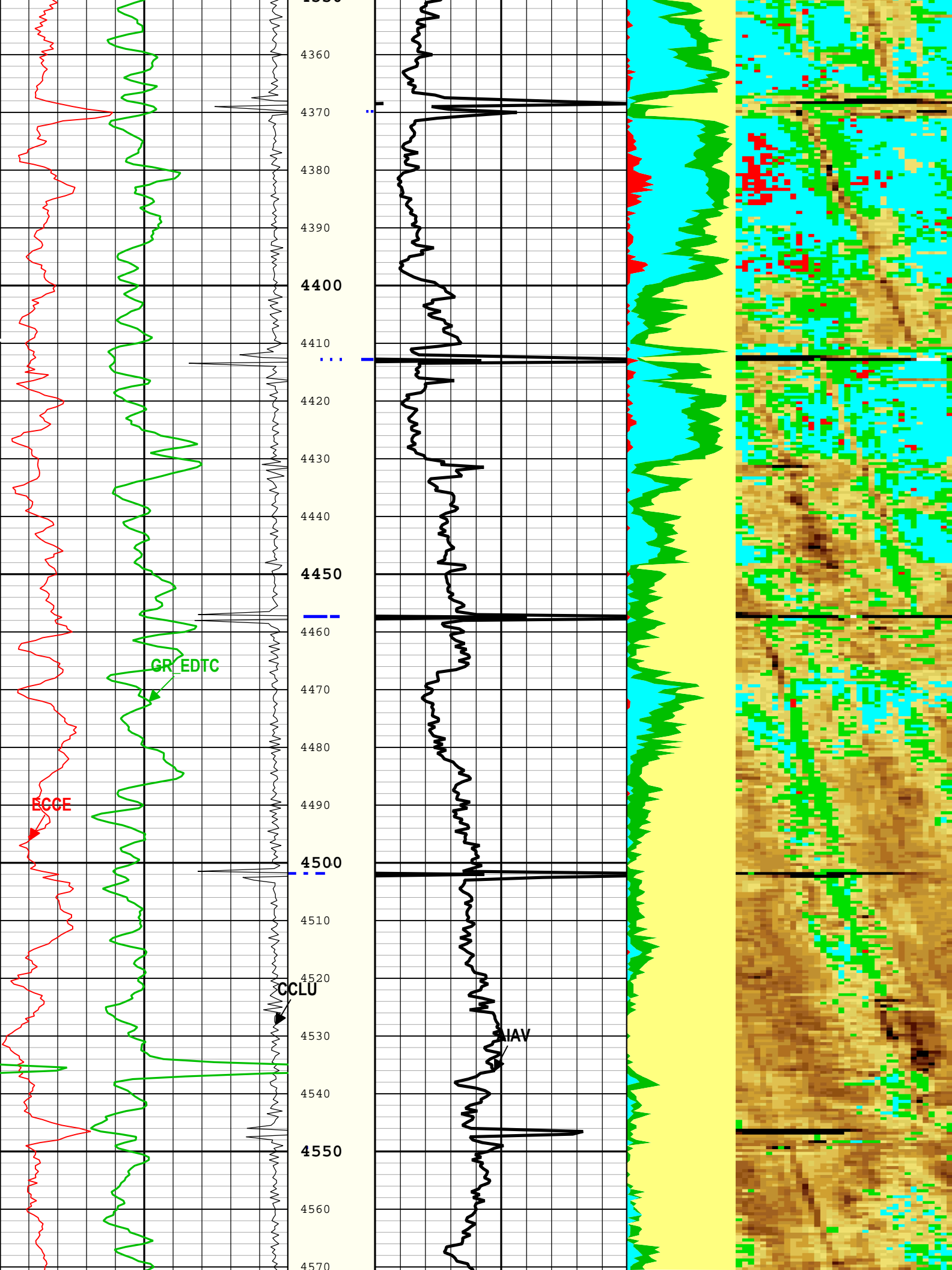


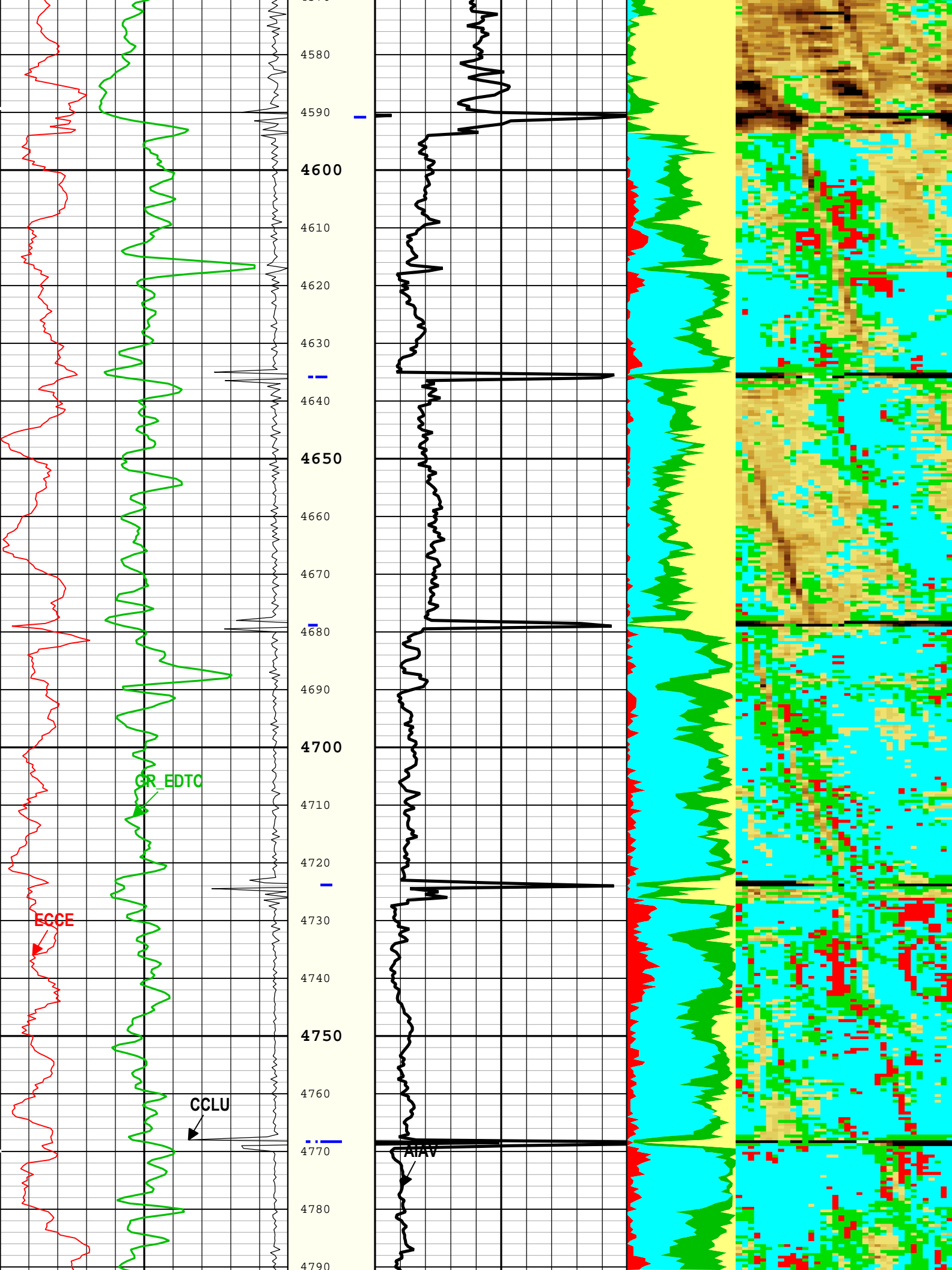


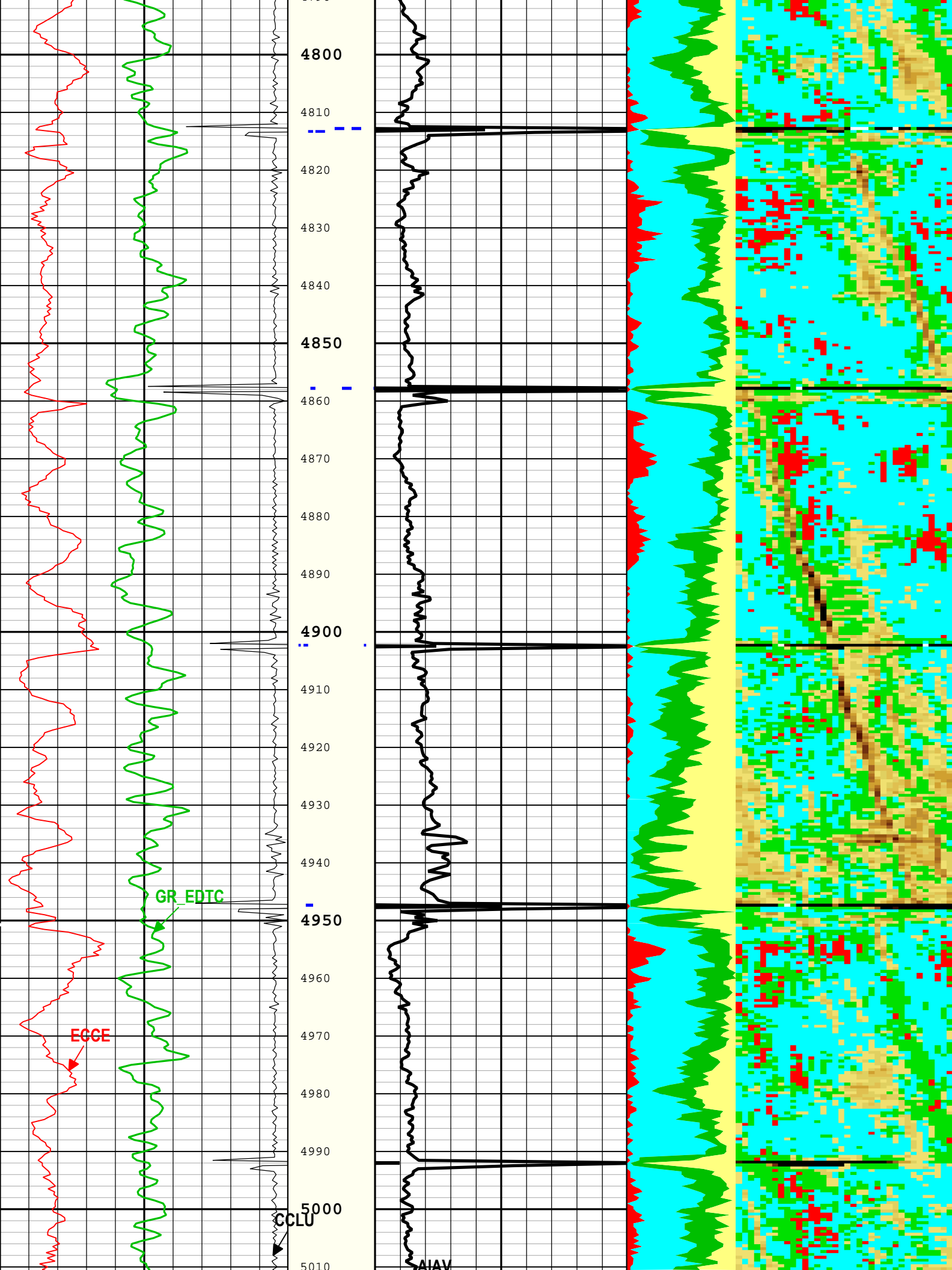


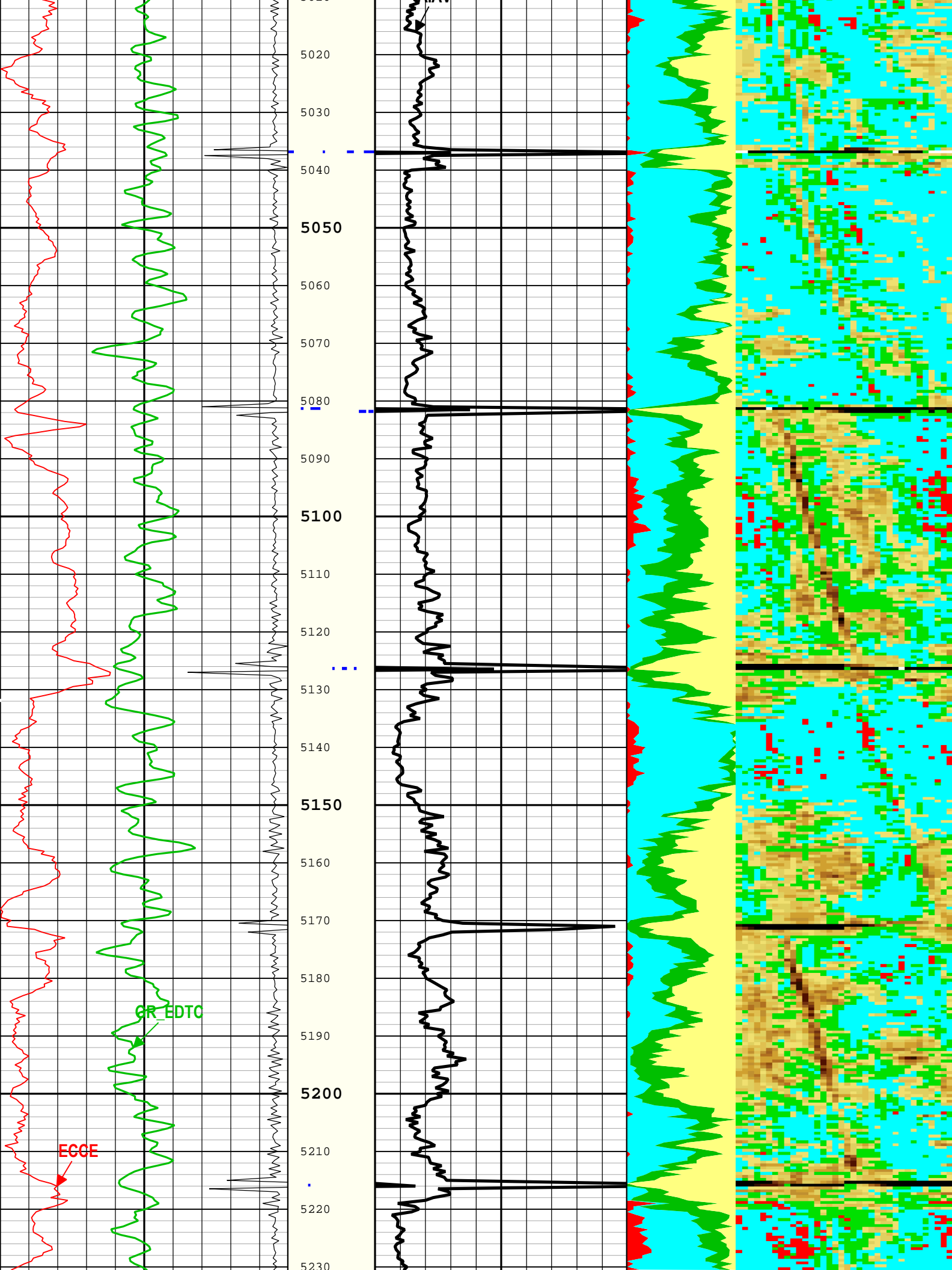


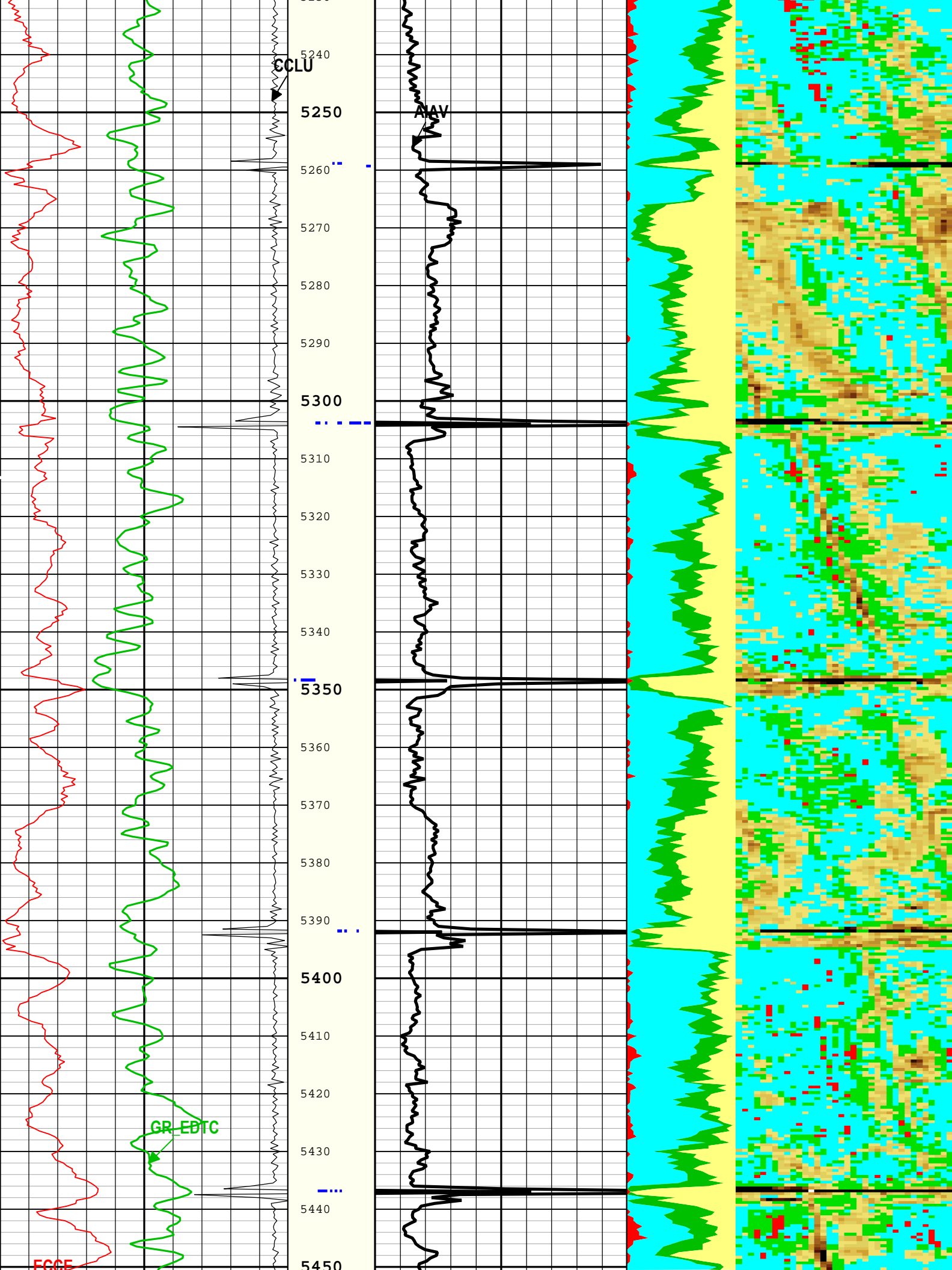


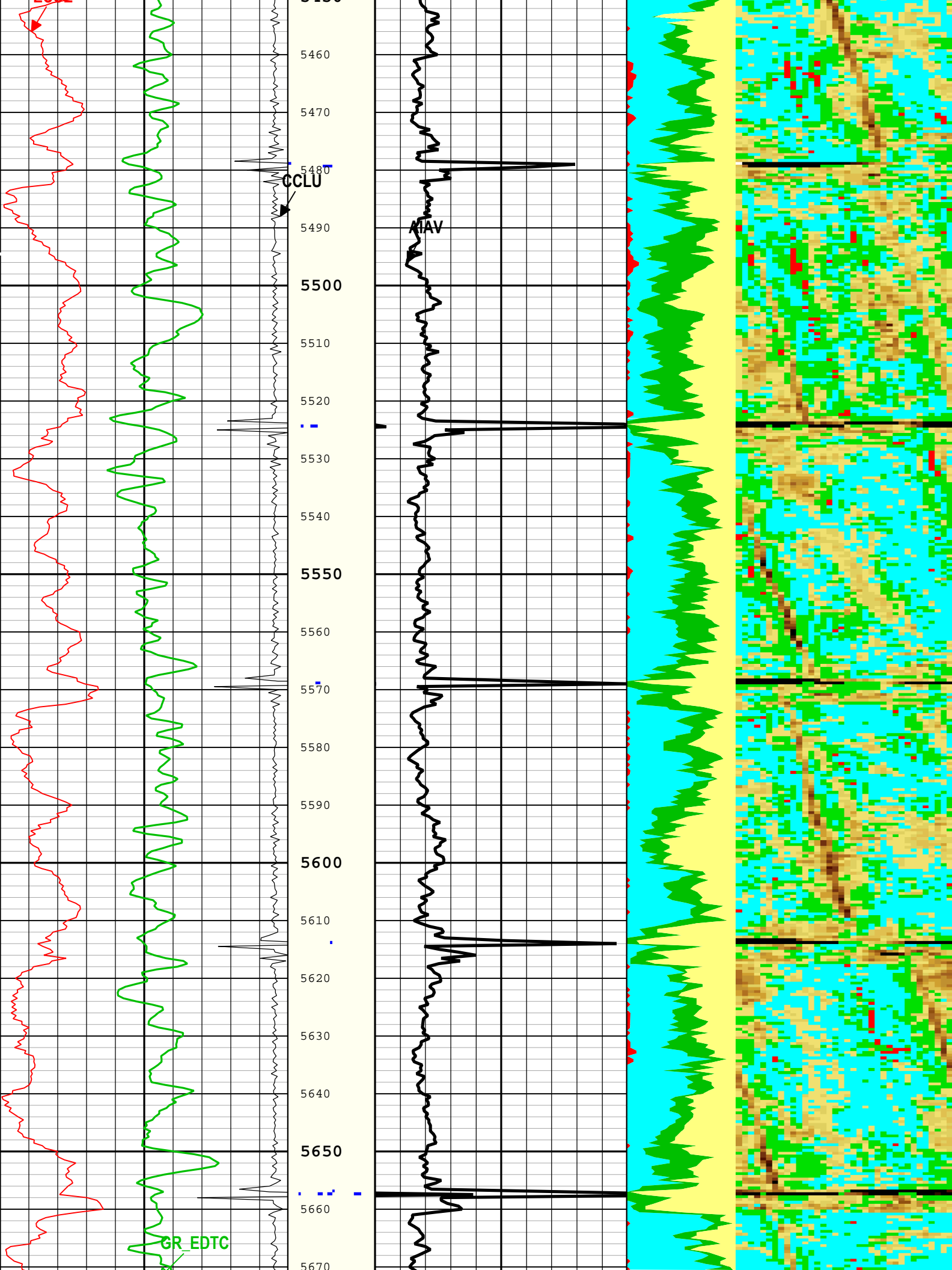


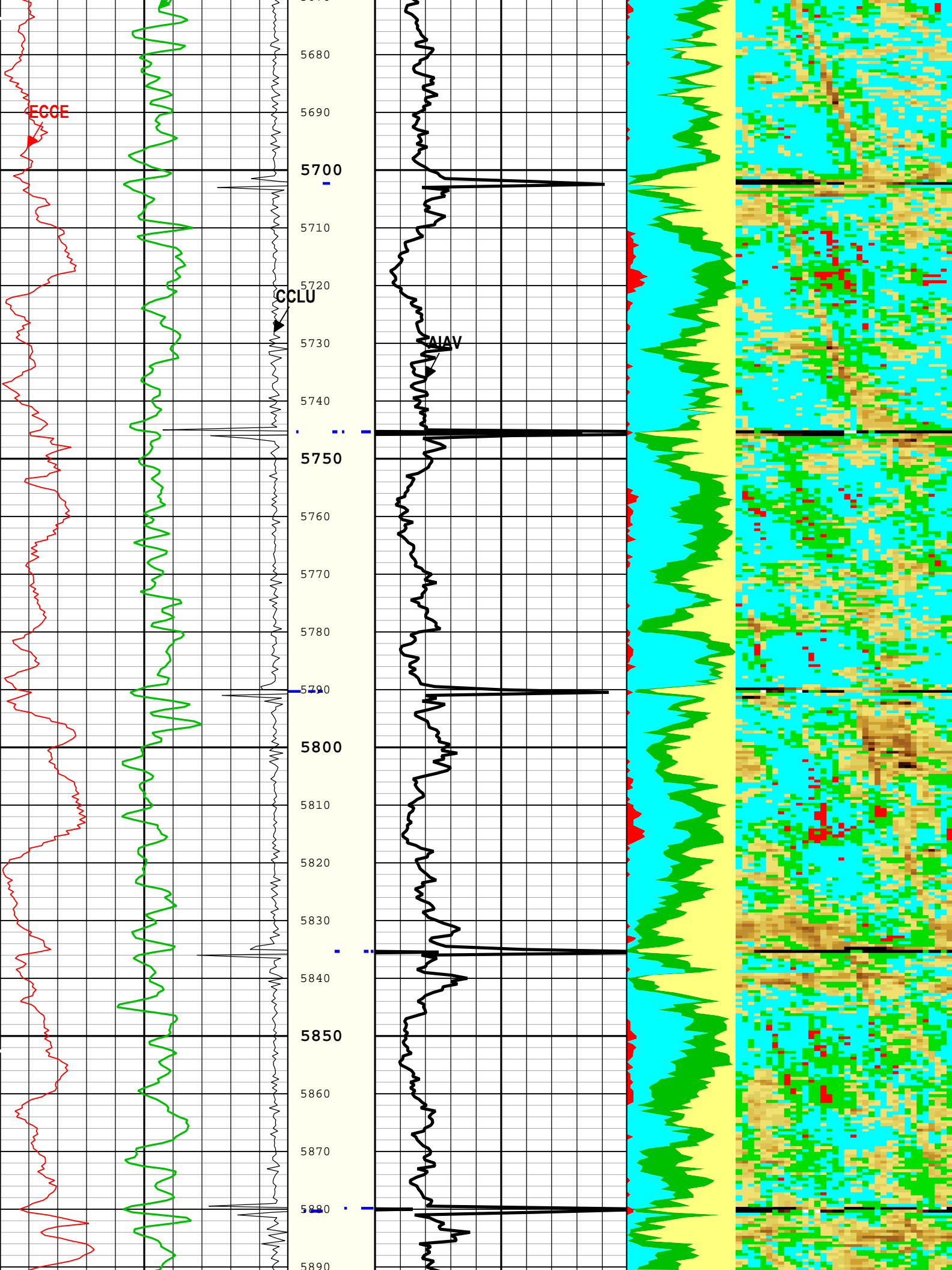


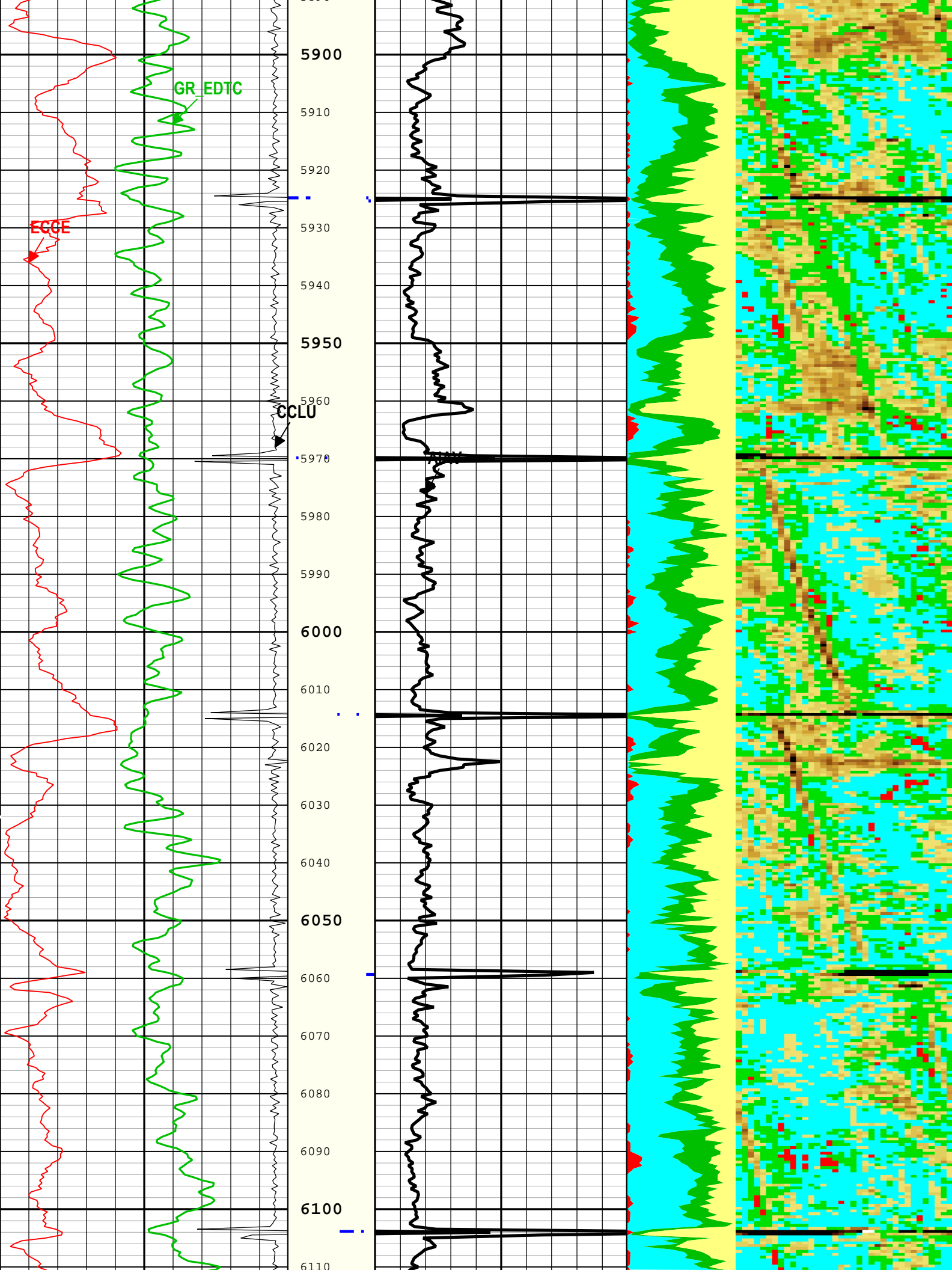


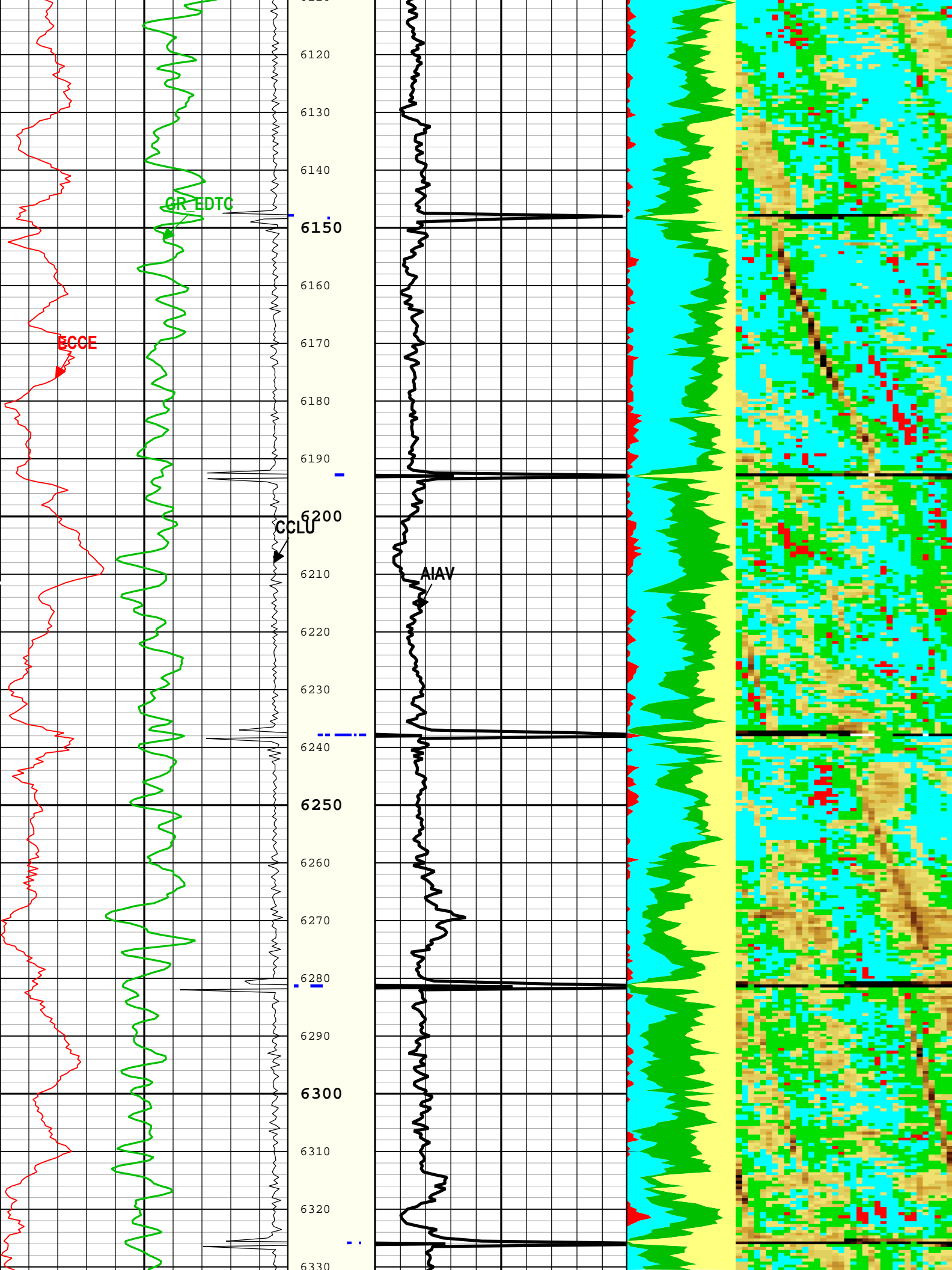


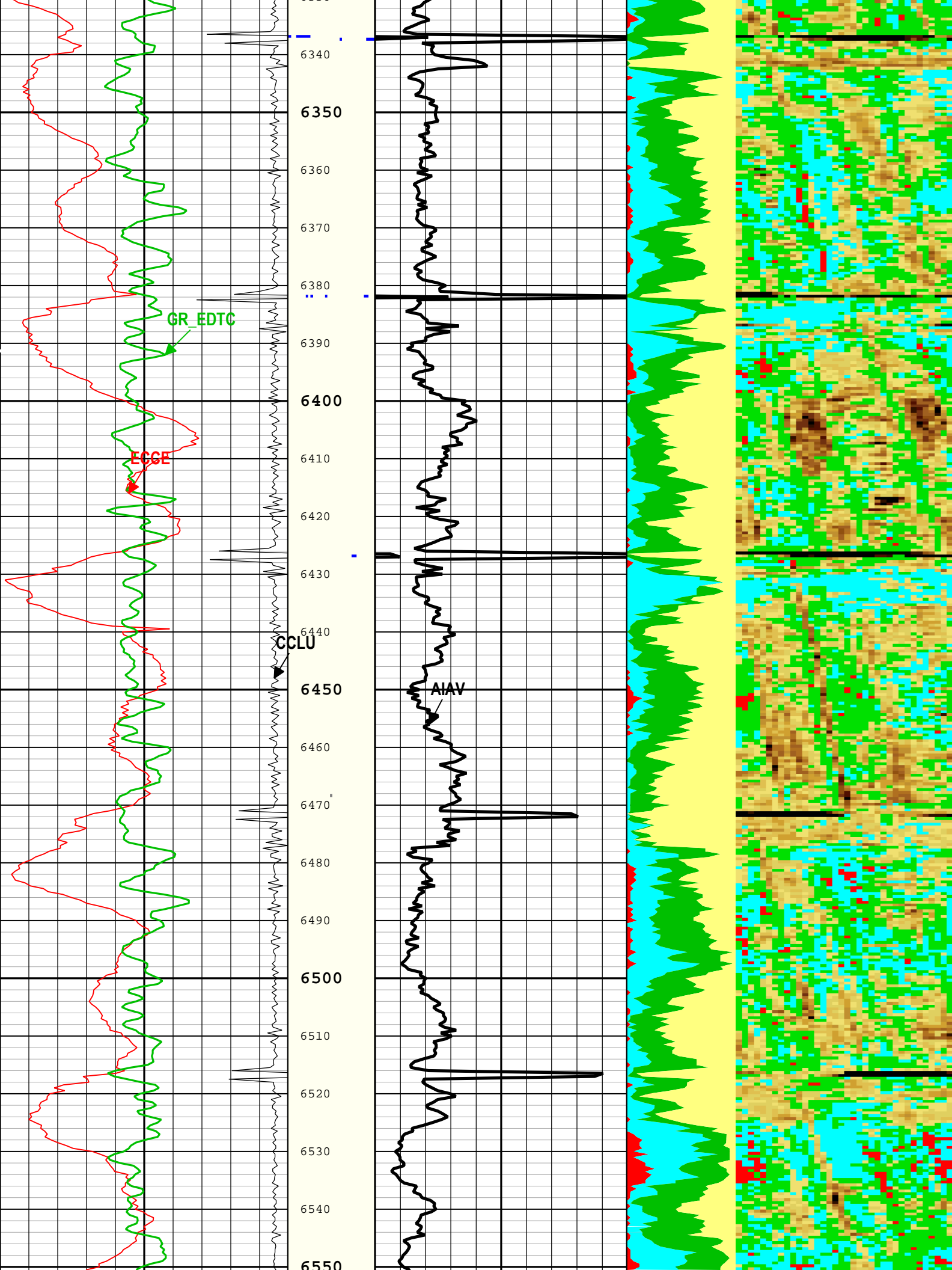


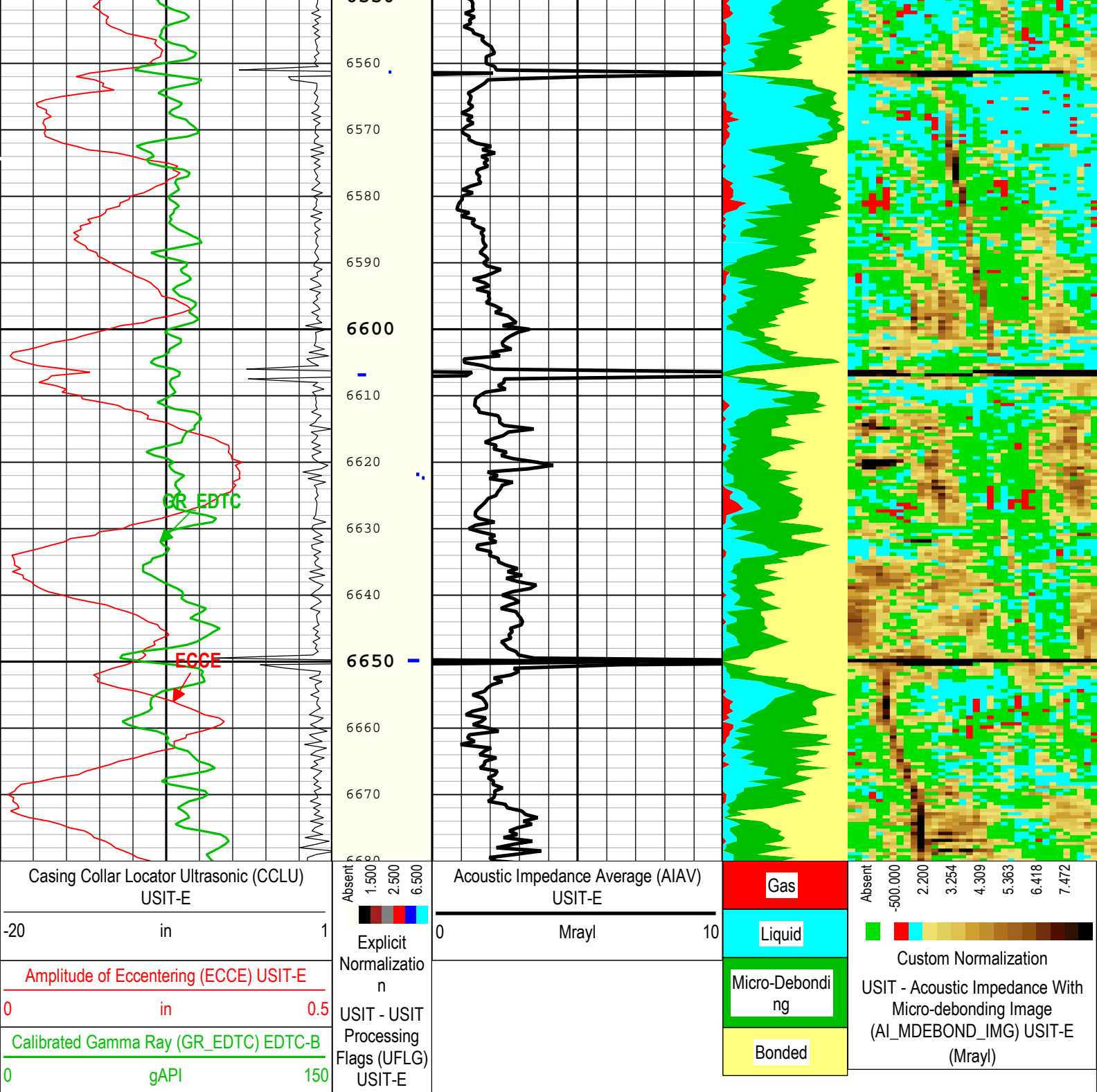












Description: Format: Log (DJ Basin Ultrasonic Cement Summary Report) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth
Creation Date: 06-Sep-2018 15:41:19

Channel Processing Parameters

1: Parameters

Parameter	Description	Tool	Value	Unit
BAR(ISSBAR)	Barite Mud Presence Flag	Borehole	No	
BS	Bit Size	WLSESSION	Depth Zoned	in
CMTY(U-USIT_CEMT)	Cement Type	USIT-E	Regular Cement	
DFD	Drilling Fluid Density	Borehole	8.4	lbm/gal
DFT_CATEGORY	Drilling Fluid Type	Borehole	Water	
DTMD	Borehole Fluid Slowness	Borehole	206	us/ft

HEMA	Hematite Presence Flag	Borehole	No	
ICE_PROCESS	ICE Processing	USIT-E	Yes	
IMAR	Image Rotation	USIT-E	Off	
MEAS_WLEN	Tcube Processing Window Length in Measurement Mode	USIT-E	22.44	us
MUD_N_FRP	Free Pipe Mud Normalization Factor	USIT-E	1.1	
U-USIT_DFSZ	Drilling Fluid Specific Acoustic Impedance	USIT-E	0.1	Mrayl
USI_FVEL_SEL	USI Fluid Velocity Selection	USIT-E	Automatic	
USI_ZMUD_SEL	USI Mud Impedance Selection	USIT-E	FreePipe Norm.	
ZMUD	Acoustic Impedance of Mud	Borehole	1.75	Mrayl
ZTCM	Acoustic Impedance Threshold for Cement	USIT-E	2.2	Mrayl
ZTGS	Acoustic Impedance Threshold for Gas	USIT-E	0.3	Mrayl

Depth Zone Parameters			
Parameter	Value	Start (ft)	Stop (ft)
BS	26	100	110
BS	13.5	110	1954
BS	8.5	1954	6680
All depth are actual.			

Tool Control Parameters	
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1: Parameters				
Parameter	Description	Tool	Value	Unit
AGMN	Minimum Gain of Cartridge	USIT-E	-12	dB
AGMX	Maximum Gain of Cartridge	USIT-E	18	dB
EMXV	EMEX Voltage	USIT-E	Time Zoned	V
HRES	Horizontal Resolution	USIT-E	10 deg	
ICE2_ACQ	Ultrasonic ICE2 Acquisition	USIT-E	Yes	
ULOG	Logging Objective	USIT-E	MEASUREMENT	
USFR	Ultrasonic Sampling Frequency	USIT-E	666667	Hz
UPAT	USIT Emission Pattern	USIT-E	Pattern 375 KHz	
UWKM	USIT Working Mode	USIT-E	Uncompressed 10 deg at 6.0 in	
WINB	Window Begin Time	USIT-E	Time Zoned	us
WINE	Window End Time	USIT-E	Time Zoned	us

Time Zone Parameters					
Parameter	Value	Start Time	Stop Time	Start Depth (ft)	Stop Depth (ft)
EMXV	50	06-Sep-2018 09:33:40	06-Sep-2018 09:45:02	6771.79	6382.47
EMXV	60	06-Sep-2018 09:45:02	06-Sep-2018 09:47:39	6382.47	5912.75
EMXV	55	06-Sep-2018 09:47:39	06-Sep-2018 10:20:10	5912.75	79.4
WINB	31.88	06-Sep-2018 09:33:40	06-Sep-2018 09:42:50	6771.79	6758.09
WINB	28.9	06-Sep-2018 09:42:50	06-Sep-2018 09:42:53	6758.09	6756.15
WINB	23.53	06-Sep-2018 09:42:53	06-Sep-2018 09:43:18	6756.15	6704.43
WINB	31.2	06-Sep-2018 09:43:18	06-Sep-2018 09:44:43	6704.43	6440.46
WINB	25.06	06-Sep-2018 09:44:43	06-Sep-2018 09:45:47	6440.46	6249.61
WINB	27.37	06-Sep-2018 09:45:47	06-Sep-2018 10:20:10	6249.61	79.4
WINE	71.88	06-Sep-2018 09:33:40	06-Sep-2018 09:43:16	6771.79	6710.3
WINE	80.32	06-Sep-2018 09:43:16	06-Sep-2018 09:46:01	6710.3	6207.27
WINE	77.32	06-Sep-2018 09:46:01	06-Sep-2018 10:20:10	6207.27	79.4
All depth are at tool zero.					

0 PSI Repeat Pass

Software Version

Acquisition System

Maxwell 2018 SP2

Version

8.2.104493.3100

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
1	Log[1]:Up	Up	1978.47 ft	2527.50 ft	06-Sep-2018 8:12:10 AM	06-Sep-2018 8:17:05 AM	ON	-10.42 ft	No

All depths are referenced to toolstring zero

Log

Company:Noble Energy Inc.

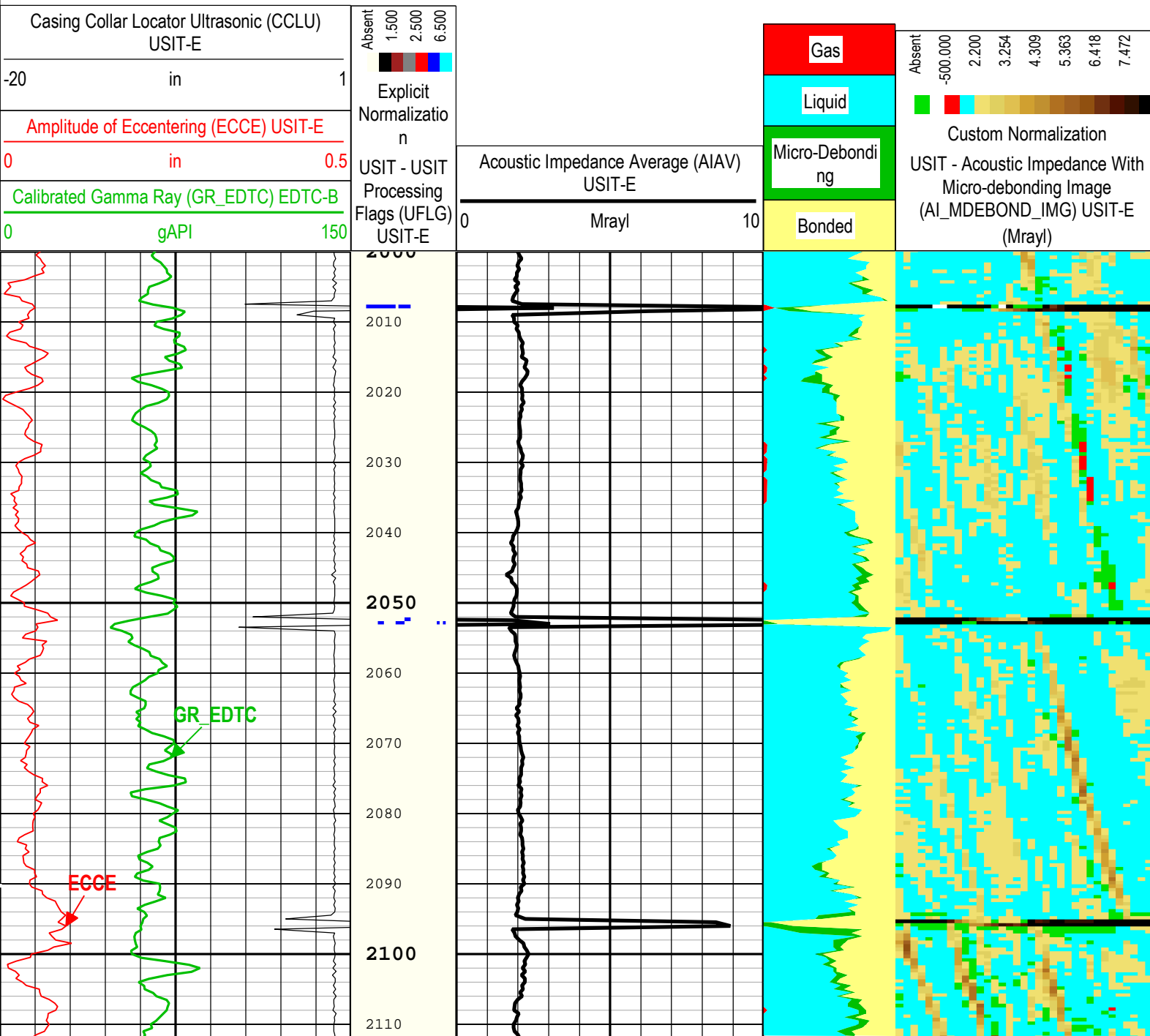
Well:Hurley H26-724

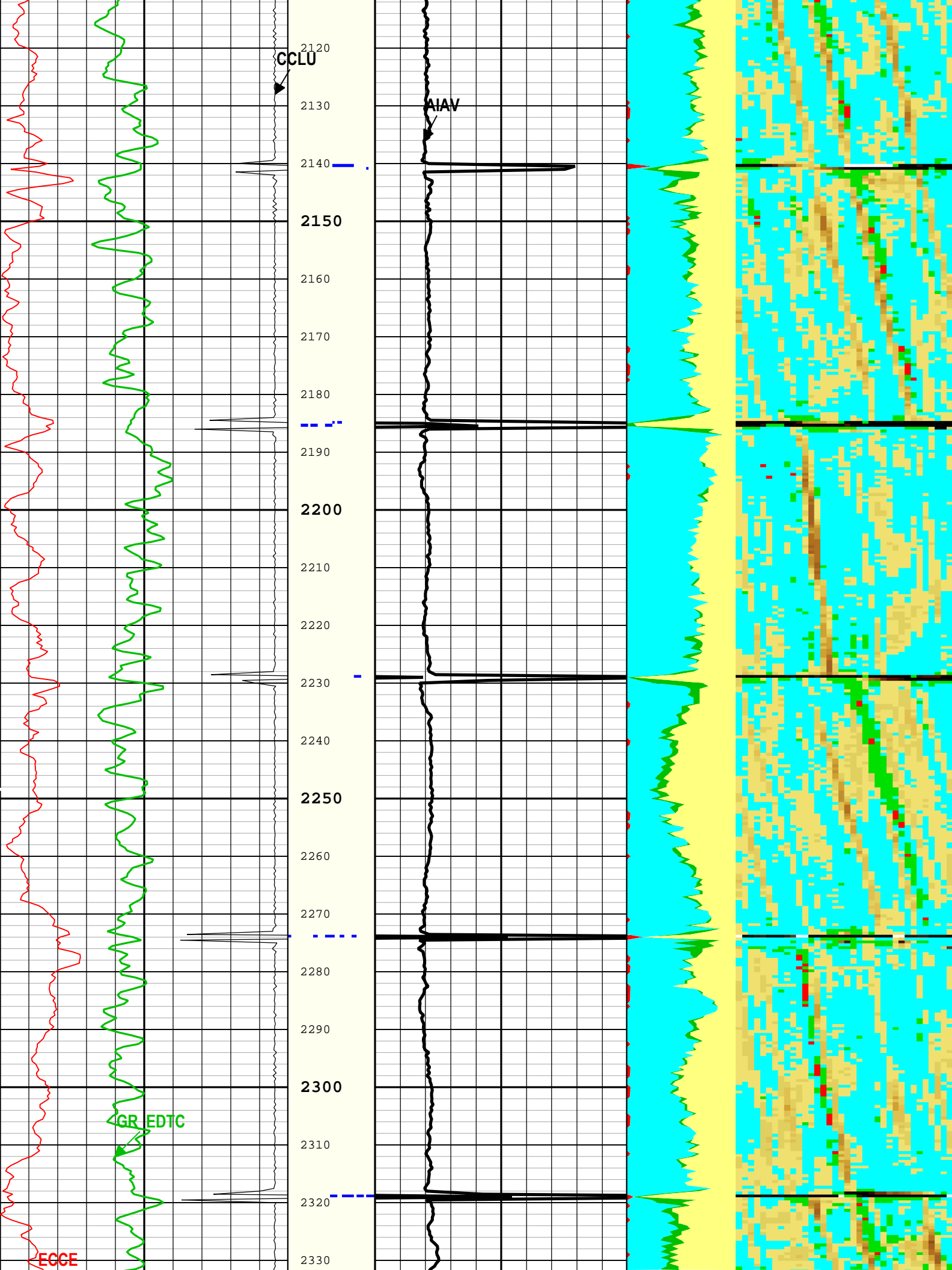
1: Log[1]:Up:S003

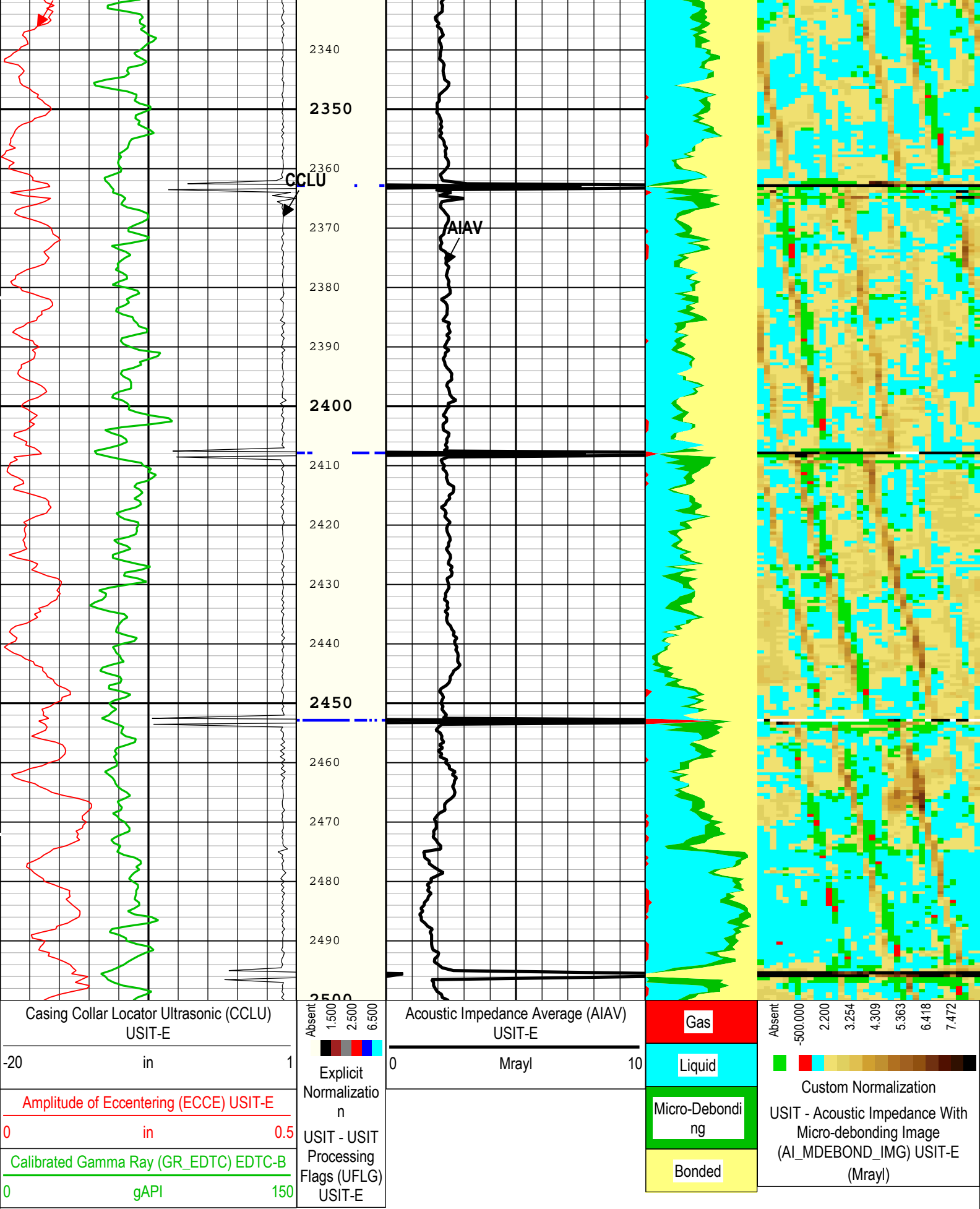
Description: Format: Log (DJ Basin Ultrasonic Cement Summary Report) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth

Creation Date: 06-Sep-2018 15:41:30

TIME_1900 - Time Marked every 60.00 (s)







TIME_1900 - Time Marked every 60.00 (s)

Description: Format: Log (DJ Basin Ultrasonic Cement Summary Report) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth
Creation Date: 06-Sep-2018 15:41:30

Channel Processing Parameters

1: Parameters

Parameter	Description	Tool	Value	Unit
BARI(ISSBAR)	Barite Mud Presence Flag	Borehole	No	
BS	Bit Size	WLSESSION	8.5	in
CMTY(U-USIT_CEMT)	Cement Type	USIT-E	Regular Cement	
DFD	Drilling Fluid Density	Borehole	8.4	lbm/gal
DFT_CATEGORY	Drilling Fluid Type	Borehole	Water	
DTMD	Borehole Fluid Slowness	Borehole	206	us/ft
HEMA	Hematite Presence Flag	Borehole	No	
ICE_PROCESS	ICE Processing	USIT-E	Yes	
IMAR	Image Rotation	USIT-E	Off	
MEAS_WLEN	Tcube Processing Window Length in Measurement Mode	USIT-E	22.44	us
MUD_N_FRP	Free Pipe Mud Normalization Factor	USIT-E	1.1	
U-USIT_DFSZ	Drilling Fluid Specific Acoustic Impedance	USIT-E	0.1	Mrayl
USI_FVEL_SEL	USI Fluid Velocity Selection	USIT-E	Automatic	
USI_ZMUD_SEL	USI Mud Impedance Selection	USIT-E	FreePipe Norm.	
ZMUD	Acoustic Impedance of Mud	Borehole	1.75	Mrayl
ZTCM	Acoustic Impedance Threshold for Cement	USIT-E	2.2	Mrayl
ZTGS	Acoustic Impedance Threshold for Gas	USIT-E	0.3	Mrayl

Tool Control Parameters

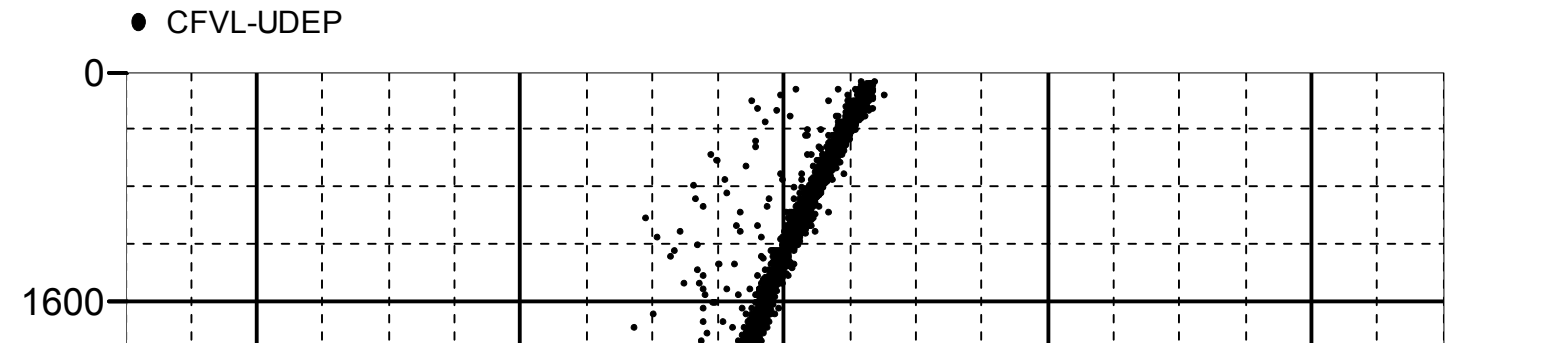
1: Parameters

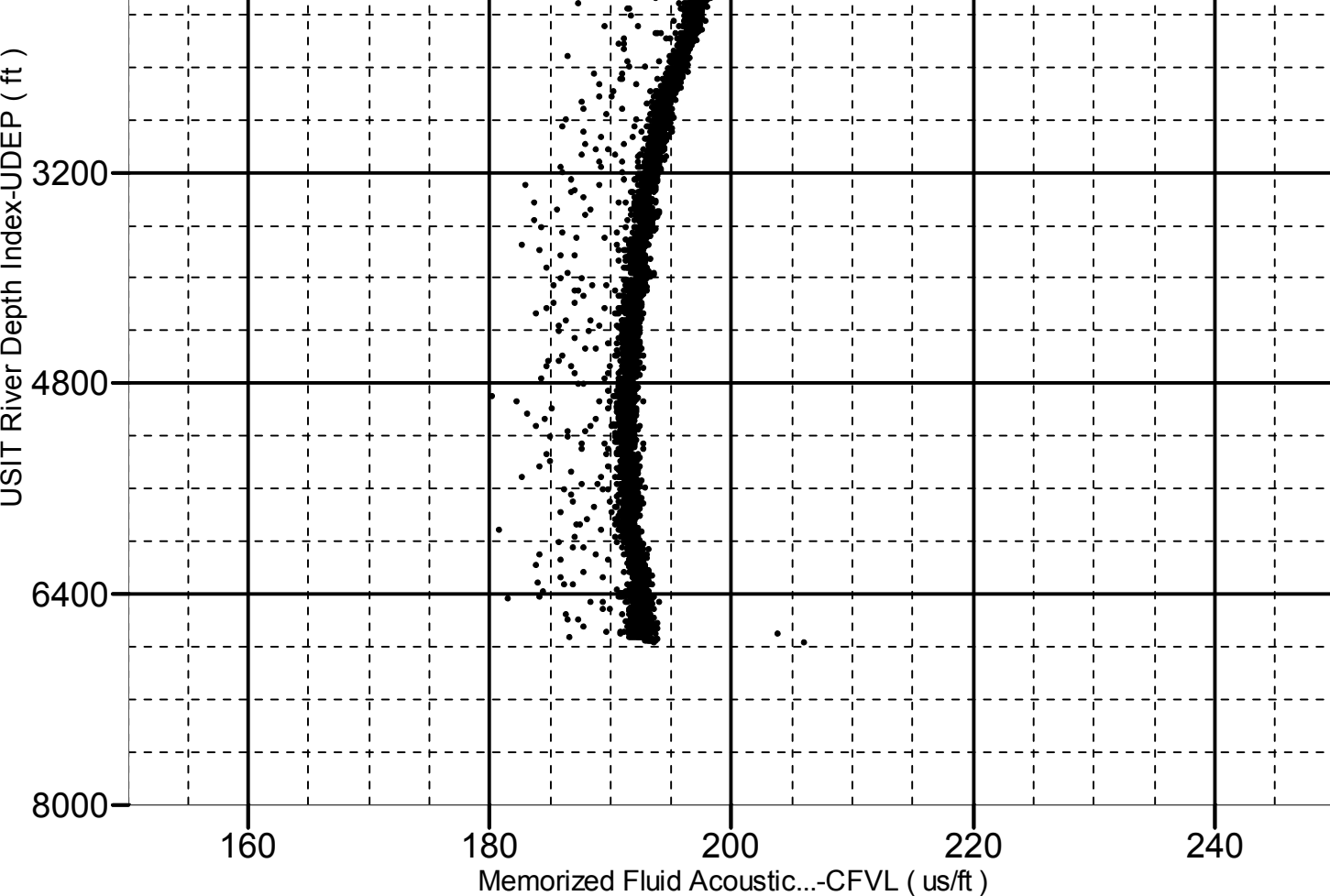
Parameter	Description	Tool	Value	Unit
AGMN	Minimum Gain of Cartridge	USIT-E	-12	dB
AGMX	Maximum Gain of Cartridge	USIT-E	18	dB
EMXV	EMEX Voltage	USIT-E	45	V
HRES	Horizontal Resolution	USIT-E	10 deg	
ICE2_ACQ	Ultrasonic ICE2 Acquisition	USIT-E	Yes	
ULOG	Logging Objective	USIT-E	MEASUREMENT	
USFR	Ultrasonic Sampling Frequency	USIT-E	666667	Hz
UPAT	USIT Emission Pattern	USIT-E	Pattern 375 KHz	
UWKM	USIT Working Mode	USIT-E	Uncompressed 10 deg at 6.0 in	
WINB	Window Begin Time	USIT-E	31.88	us
WINE	Window End Time	USIT-E	71.88	us

Fluid Acoustic Slowness vs Depth

2D Cross Plot

Index Range: From 6771.50 to 79.50 ft





XYZ

Company:Noble Energy Inc. Well:Hurley H26-724

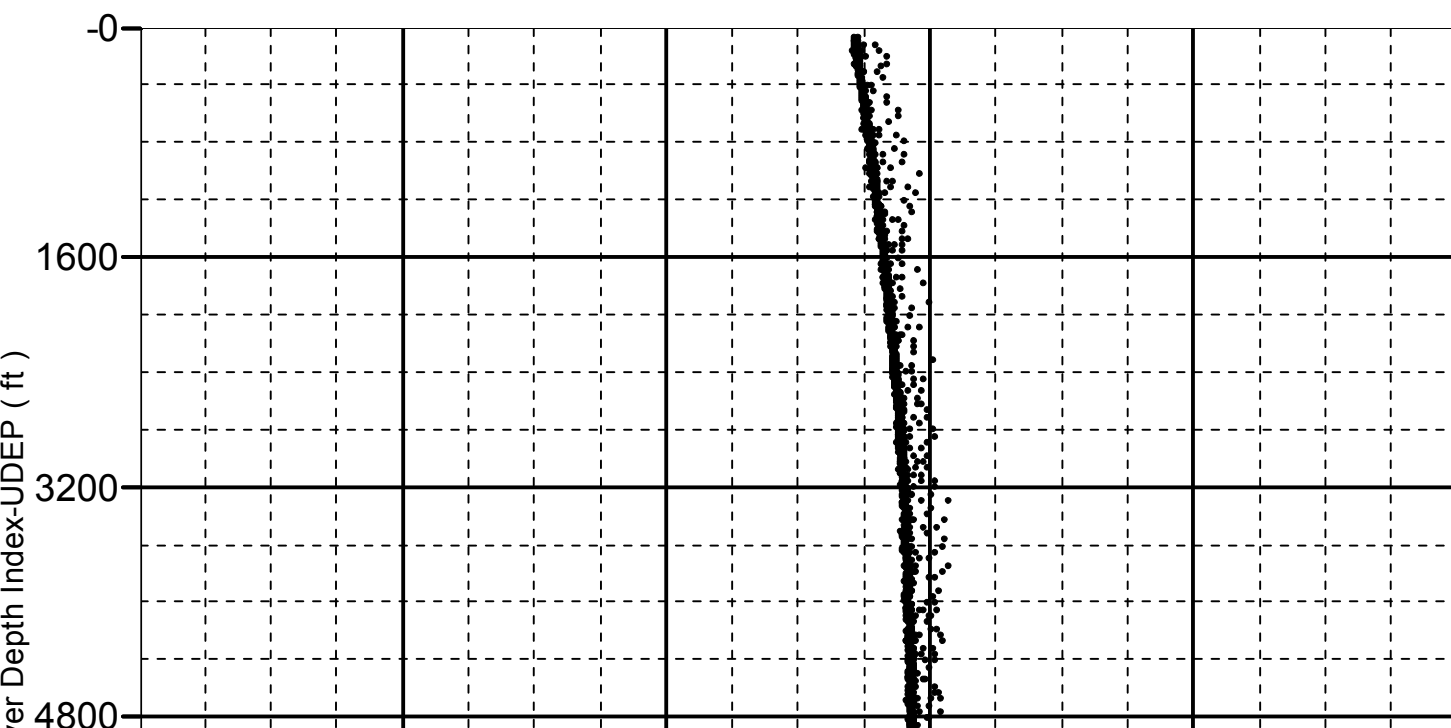
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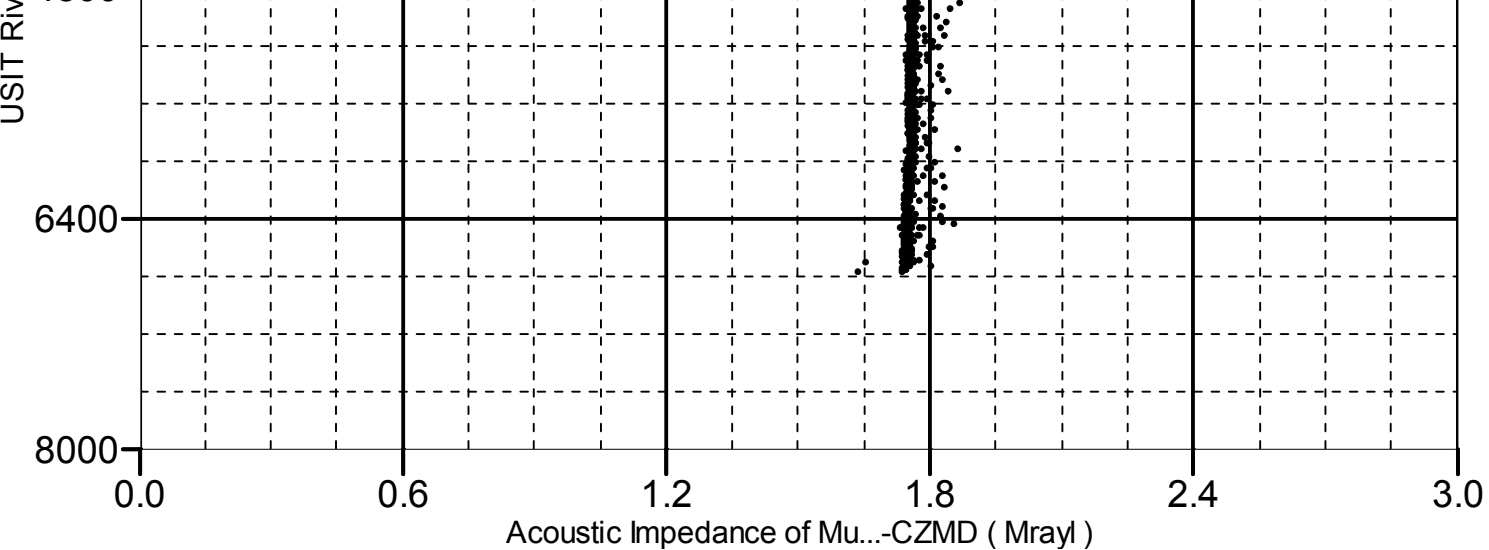
Acoustic Impedance of Mud vs Depth

2D Cross Plot

Index Range: From 6771.50 to 79.50 ft

● CZMD-UDEP





Company:	Noble Energy Inc.	Schlumberger
Well:	Hurley H26-724	
Field:	Wattenberg	
County:	Weld	
State:	Colorado	

